COURSE GUIDE

**LIS 201
KNOWLEDGE ORGANISATION
CLASSIFICATION) I**

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LIS 201 KNOWLEDGE ORGANISATION (Classification) INTRODUCTION

LIS 201: Knowledge Organisation (Classification) 1 is a first-semester course with 2 credit unit which will last for a minimum duration of one semester. It is a compulsory course for all undergraduates in the Department of Library and Information Science at the university. It is also suitable courseware for library students who wish to acquire the needed knowledge on how knowledge is been organised. This course will further help students to gain practical skills on how books and various resources in the library are classified for easy accessibility and retrieval. The course examined the definition of concepts, information explosion and the need for organisation of information resources; history and development of knowledge classification; essence and types of classification schemes; Knowledge organisation and Classification; theories of classification, development and practice of classification; types of classification scheme; normative principles of Classification; Techniques of Information and Knowledge organisation; Modes of Subject Heading and Indexes formation; Universe of Knowledge Structure And Architecture; Notation and construction of Classification Number; Current trend in Library classification; Practicum (DDC, and LC) and Subject Indexes

COURSE AIMS

This course aims to introduce you to the general knowledge of the organisation and classification of information resources. These include information explosion and the need for proper knowledge organisation; history and development of knowledge; Classification; essence and types of classification schemes used by different libraries. The different classification schemes are discussed alongside their advantages and disadvantages. The course consists of five modules with fifteen units of study. In this course, you will also learn the normative principles of classification, a universe of knowledge structure or architecture, modes of subject heading and indexes, construction of call numbers and more importantly, you will have practical sessions on how to classify library materials using LCC and DDC scheme. Knowledge and understanding of these concepts and the functions of library classification will enable you to know the work and duties of library or information professionals.

COURSE OBJECTIVES

To achieve the above aims, some course objectives must be considered. Each unit in this study material has specific objectives which will guide you in checking on your progress while you do your study.
By the end of this course you will be able to:

- Define information explosion
- Define information overload
- List and explain the causes of information overload
- Justify the need for information organization
- Discuss the history and development of knowledge classification
- Define the term classification
- Differentiate between knowledge classification and library classification
- List and explain the theories of classification
- Explain the different normative principles of classification such as canon for idea plane, canon for work at the verbal plane and canon for work at the notational plane
- List and explain the features and purpose of the classification scheme
- Define classification scheme
- Types of Library Classification Scheme
- Define the universe of knowledge organisation
- List the different types of the subject structure
- Explain the modes of formation of a subject
- Discuss the modes of subject Heading and Indexes formation

WORKING THROUGH THIS COURSE

To complete this course successfully, you have to go through the modules and carefully read the study units, do all practical exercises and assessments and also open and read through the links provided by double-clicking on them. Read the recommended books and other materials available to you and ensure you attend the practical session of this course. Always participate in the online facilitation and facilitation going on in your study centre. Each unit of study has an introduction, objectives you should achieve at the end of the study, a conclusion and summary informing you in a nutshell what you studied in the unit. Above all, there is the Tutor-Marked Assignment (TMA) to evaluate what you have learnt. You can download the courseware into your device so that you can study it whenever you are offline.

ASSESSMENT

There are two main forms of assessments namely; formative and the summative. The formative assessments at the end of every unit of study will enable you to evaluate your learning output. The university uses the summative assessments to evaluate your academic performance in the courseware you studied. The summative assessment which is a Computer-Based Test (CBT) is made up of objectives and sub-objective questions. There are 3 continuous assessments, 10% each and final

examinations are based on 70%. You are required to take all the computer-based tests and the final examination.

STUDY UNITS

There are 15 study units in this course, divided into five modules. The modules and units are presented as follows:

Module 1   Concept of Information Explosion

Unit 1   Information explosion and Need for Organisation of
                Information Resources
Unit 2   History and Development of Knowledge and
                Classification

Module 2   Theories and Normative Principles of Classification

Unit 1   Theories of classification,
Unit 2   Normative Principles of Classification - Canons for Idea
                Plane
Unit 3   Normative Principle: Canon for Work at the Verbal Plane
Unit 4   Normative Principle: Canon for Work at the Notational
                Plane

**Module 3   Understanding Classification and Library
                Classification**

Unit 1   Concept, Features and Purpose of Library Classification
Unit 2   Classification Schemes and Types of Library
                Classification Schemes
Unit 3   Library of Congress Classification Scheme
Unit 4   Dewey Classification Schemes

Module 4   Information and Knowledge Organisation

Unit 1   Techniques, Universe of Knowledge Organisation,
                Structure and Architecture
Unit 2   Modes of Subject Heading and Indexes Formation
Unit 3   Notation and Construction of Classification Numbers

**Module 5   Practicum and Current Trend in Library
                Classification**

Unit 1   Practicum on Library of Congress, Dewey decimal
                classification and Subject Indexes
Unit 2   Current Trend in Library ClassificationSystems

HOW TO GET MOST FROM THIS COURSE

To get the most from this course, there is an urgent need for you to acquire a personal laptop and access to the internet. This will give you ample opportunity to study anywhere and time. The unit objectives of the course will guide your self- study effort.

Always evaluate your learning at the end of the unit by attempting the tutor mark assignment to find out your learning outcome in each unit. Endeavour to participate in all facilitations organized for this course for better understanding. If you run into trouble, arrange to meet your facilitator or the Librarian at the E-library for further clarification.

To get the most from this course endeavour to do the followings:

- Read the course guide thoroughly
- Develop a study schedule. Whatever method you choose to use, you should decide on it and write out dates for working on each unit.
- Always adhere to study schedule, the majority of the students fail because they do not have a study schedule or that they have but do not follow it religiously.
- Read the introduction and the objectives of any unit you want to study before going into the content of the unit.
- At the end of the unit, review the objectives and see how many of them you have achieved.
- Attempt the Self - Assignment Exercise
- Do the same in every unit throughout the course.

SUMMARY

Knowledge organisation (classification) I, is intended to make you understand the need for organisation and classification of library materials, the purpose of library classification and the need for the notation in library classification. At the end of the course, you will achieve the objective if you follow the instructions and do what you are asked to do. We wish you success as you adhere strictly to the instructions and advice given to you for this course.

MAIN COURSE

CONTENTS   PAGE

MODULE 1   ORGANISATION OF INFORMATION

This module introduces you to the concept of information explosion, history and development of knowledge and classification.

Unit 1   Information Explosion
Unit 2   History and Development of Knowledge and
                Classification

UNIT 1   INFORMATION EXPLOSION

CONTENTS

1.0   Introduction
2.0   Objectives
3.0   Main Content
        3.1   Concept of Information Explosion
                3.1.1   Information Overload
                3.1.2   Causes of Information Overload
        3.2   Need for Information or Knowledge Organisation
4.0   Conclusion
5.0   Summary
6.0   Tutor-Marked Assignment (SAEs)
7.0   References/Further Reading

1.0   INTRODUCTION

This unit will introduce you to what information explosion is, the fallout of information explosion, information overload and it causes. We will also discuss the need for the organisation of information for easy accessibility and use.

2.0   OBJECTIVES

By the end of this unit, you will be able to:

- define information explosion
- define information overload
- enumerate the causes of information overload
- sate the need for information organisation.

3.0   MAIN CONTENT

3.1   Concept of Information Explosion

Information can be said to be the outcome of a process data; t is data that has been processed, interpreted and understood by the recipient. Hence, for anything to be termed information, it must have undergone some processes. These processes involve collecting data, organizing, filtering and transforming data into information that is meaningful to the user. Information is an important resource in all sphere of human life.

Regularly, thousands of printed books and other information materials are published locally and internationally. More and more information is generated on the internet daily with the advancement of information communication technology (ICTs). This vast amount of information increases every day and making it difficult for people to read all. It has been so overwhelming that people find it difficult to access, read and use available information resources.

Information explosion is the proliferation, creation, spread or increase in the amount of information either published or unpublished form. It is a situation that describes the rapidly increasing amount of published information and the effects of this abundance of data (Johnson, Zion & Prabhu, 2019). Apart from the publication of thousands of printed publications, there are millions of data and information available to the public on the internet and social media platforms. Many of these vast amounts of information are sometimes irrelevant to the recipients or users. This abundance of information makes it impossible and challenging for users to read all the available information because users are confused as to how they can search and evaluate resources on the internet to get the right information they need to satisfy their needs.

Figure 1: Information Explosion
Source: https://eacpe.org/the-information-explosion/

The explosion of information has affected all ramification of life such as the workplace, academic environment, political environment and the environment in which we live in general. Too much information can be overwhelming and stressful for people to locate and use. It can also cause anxiety and fatigue for users and may affect decision making as users may not be able to get the actual information they need.

Elson highlighted 7 signs of information fallouts from information explosion and they include;

1.   Due to the availability of a vast amount of information, people or users of information tend to know less which makes it even difficult for people to make decisions.
2.   Too much-unfiltered information available to users can cause brain-freeze which can make it more difficult for users or people to get the needed or right information.
3.   Users of information find it difficult to say no to some information or their sources as many are so use to some resources on the internet or in a printed format not because these sources are original but because they are addicted to them.
4.   Shorter attention span because of the huge amount of information may make it tough for people to concentrate.
5.   Information users make mistakes due to use of contaminated or soiled data.
6.   Too much of available information to users make it more difficult to select the right information from this large amount of information sources.
7.   To keep abreast of available information, people think more of the past than the present.

In the era of the huge amount of information, people find it difficult to access the right information resources they need. The vast availability of published information has made managing information difficult thereby leading to information overload.
At this point, you may be wondering what information overload is? Now let us discuss what information overload is and some of the causes of information overload.

3.2   Information Overload

Information overload is a problematic phenomenon to people or information users in general due to the constant generation of information in printed format, on the internet and social media platforms such as emails, television, radio, webpages etc. Umezor (2017 p.35) defined information overload is "a situation in which the speed at which information is flowing is so overwhelming that it is difficult to keep

pace with it. It equally applies to a situation in which there is so much information available but access to it is a major problem." Information overload, therefore, is the overabundance of information that hinders information users' capacity from processing it due to excess of information. Information overload can also be termed infobesity, information bog, information smog, information anxiety, information glut, information explosion etc.

Figure 2: Information Overload
Source:https://professionallyspeaking.net/information-overload/
One may wonder what causes information overload. At this juncture, we are going to discuss the causes of information overload.

3.3   Causes of Information Overload

There are various causes of information overload and they are:

1.   Increase Duplication and Transmission of Data across the Internet
2.   Increase Production Rate of New Information
3.   Increase in the Channel of Information
4.   Increase the amount of Historical Information:
5.   Inaccurate and Contradictions of Information

Lack of Methods for Comparing and Evaluating Information Sources:

1.   The Simplicity of Sharing Information Online:

3.3.1   Increase Duplication and Transmission of Data Across the Internet

One of the causes of information overload is the duplication and transmission of thousands of the same information content or data across the internet. Duplication of data makes it difficult for information users to locate the specific information resources they need to satisfy their needs. For example, a user is in search of information on Malaria parasite on the internet; you will be shocked at the number of information resources the user will come across on the internet. Sometimes, the user will see ten (10) copies of the same title of a book or an article. Some of the copies may be in Microsoft, pdf, Html, Slide Share etc. Duplication and transmission of data on the internet make it overwhelming for information users to search for information let alone locating the right information that they need.

3.3.2 Increase Production Rate of New Information

New information is produced on a regular and daily basis. The information could be published or unpublished on the internet. An increase production rate of information may cause problems for information users because not all users can be able to keep up with information thereby making it difficult for users to locate and select the right information. The production rate of new information resources makes it tough for users. For example, an information user may need information in an area in business management, while he/she is struggling to understand business management by reading the first volume of a title, another volume of that same title is published and have updated information on the volume he/she is currently reading. The increase in information production may be disturbing and stressful for the user due to the vast amount of information on the same topic.

3.3.3 Increase in the Channel of Information

There are so many channels through which information is shared that cause an information explosion. These channels include emails, instant messaging, television, radio and other social media platforms. Through these channels, a piece of single information can be shared countless times over the internet. For example, when an information user searches for information on Diabetes on Google, he or she can get thousands of Webpages on the internet that discusses diabetes. These Webpages will give too much information on diabetes that will overwhelm the user and makes it difficult to understand and if the user is not careful, he/she will be confused.

3.3.4 Increase the Amount of Historical Information

With the advancement of information communication technology (ICT), people can have access to a vast amount of historical information just by a click on the internet or reading historical books. However, due to the abundance of historical information on the internet and published books, it may cause fatigue for users.

3.3.5 Inaccurate and Contradictions of Information

Inaccurate and contradictory information can lead information users to make the wrong decisions. Most times, the information found on the internet are not written or published by professionals in various fields and as such many of the information is inaccurate and the content of information resources contradict each other. These contradictions can confuse information users and can lead to fatigue and anxiety.

3.3.6 Lack of Methods for Comparing and Evaluating Information Sources

The advancement of technology has led to the proliferation of information and information resources on the internet which has made it difficult for information users to access the right information because of a huge amount of information scattered all over the internet. However, there are no methods to filter or validate trustworthy information for users. Hence, people use and share information with others without having a rethink whether the information is trustworthy or not.

3.3.7   The Simplicity of Sharing Information Online

The use of the internet and social media has made it easier for people to share information online with fewer restrictions. Before the advent of information technology, only professionals share information with a specific audience. Nowadays, the internet has made it easier for every non-professional to share information that is not authentic to a larger audience.

3.4   Need for Organisation of Information

From the causes of information overload, we know we are living in the era of information explosion. Information resources are scattered all over the place in various media and formats. There is a need for this scattered information or knowledge to be arranged or managed in such a way that information seekers or users can have access, locate and retrieve information at the right time and place. It becomes necessary for

information or knowledge to be organised to avoid confusion on the part of information users.

The organisation of information or knowledge will help to avoid chaos and save the time and effort of users in searching and locating the needed information. Libraries house books, non-book materials and electronic information resources for access by library users. Therefore, libraries are the only institution that is charged with the selection, acquisition, organisation, storage and dissemination of information resources to meet the information needs of their users. The function of the library is to ensure every reader, his/her book and every book, its reader according to the second and third law of library science proposed by Ranganathan. The second law of library science shows that libraries should endeavour to provide the needed information resources for their users by building their collections based on the users' information needs. In this case, library professionals take into account the format that is appropriate for their users and ensure that the available information resources or materials are relevant, reliable and authentic. On the other hand, the third law ensures that libraries provide information resources needed by users and make these resources freely available and accessible. Making information resources available and accessible involves the organization of information or knowledge. Libraries with the assistance of librarians or information professionals need to be involved in the organization of these information resources according to their likeness and difference.

The organisation of information, therefore, means that information is arranged in a convenient way to ensure users not only locate information resources but also get the right information they need. This means that the vast amount of information scattered in various format and media such as radio, television, social networking sites, blogs, email etc. are arranged and classified according to their content for easy access and retrieval. With the explosion of information due to advancement in information communication technology (ICTs), libraries cannot just focus on organising information resources physically on the shelves. It is worthy to note that information resources are not organised according to colour, size, the number of pages, height, title, author etc. Rather, they are classified according to their subject or content instead of their physical features.

Clark (1999) highlighted the following as the need for classification of information resources:

1.   Organisation or classification of information resources brings materials on the same subject together. This will aid users to easily retrieve needed information.

2.   The organisation of information or knowledge shows the closeness between subjects. For example, Mathematics is a subject that is divided into various branches such as Algebra, Arithmetic, Geometry and Calculus. These branches are related to other fields like physics, chemistry and other sciences. So likewise, computer science has other branches such as algorithm, computer security, computer graphics, computer architecture and databases. These branches are related to another field like mathematics.

3.   Classification ensures the orderly arrangement of information resources on the library shelves.

4.   Library professionals employ a classification scheme that enables the use of notation to represent subjects thereby making it easy for library users to identify and locate the needed information resources.

5.   It aids in the compilation of bibliographies.

6.   It allows for the addition of new books to the library collection.

At intervals, libraries acquire new information resources and classification of these materials help in adding these newly acquired resources to the library's existing collection.

Librarians or information professionals are saddled with the responsibility of assisting library users in identifying their information needs, searching and locating the needed information resources in the right format to meet their needs. However, with the abundance of information in a printed form such as paper, document, files, records and online electronic resources shows that information professionals need to equip themselves with current and appropriate tools that will enable the organization of both printed and electronic resources. Library professionals will need to provide professional guidance to inform users on the use of online information resources especially in this era of information explosion or overload.

4.0   CONCLUSION

Information explosion is a problematic phenomenon that has to a large extent affected information user in their search for information. The advancement of information technology has brought about the proliferation of information in abundance which has overwhelmed users, causing stress, fatigue, anxiety and tiredness. It is the role of libraries and librarians to ensure information resources are well organised for easy access, retrieval and use.

5.0   SUMMARY

In this unit, we have discussed information explosion and information overload, the causes of information overload and the need for organisation of information. If you remember, we define.

Information explosion is the proliferation, creation, spread or increase in the amount of information either in published or unpublished form. It is a situation that describes the rapidly increasing amount of published information and the effects of this abundance of data.

Information Overload**,** on the other hand, is "a situation in which the speed at which information is flowing is so overwhelming that it is difficult to keep pace with it. It equally applies to a situation in which there is so much information available but access to it is a major problem.

We also discussed the causes of information overload to include;

1.   Increase duplication and transmission of data across the internet
2.   Increase the production rate of new information
3.   Increase in the channel of information
4.   Inaccurate and contradictions of the information
5.   Lack of methods for comparing and evaluating information sources

6.0   TUTOR-MARKED ASSIGNMENT

1.   What is an information explosion?
2.   What is information overload?
3.   List and discuss five causes of information overload.
4.   Discuss the need for information or knowledge organisation.

7.0   REFERENCES AND FURTHER READING

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UNIT 2   HISTORY AND DEVELOPMENT OF KNOWLEDGE CLASSIFICATION

CONTENTS

1.0   INTRODUCTION

Having learnt about information explosion, information overload and its causes and the need for organization of information in unit 1, in this unit, we will discuss the history and development of knowledge classification.

2.0   OBJECTIVES

By the end of this unit, you will be able to:

- discuss the history and development of knowledge classification
- define the concept of classification
- development of knowledge classification
- differentiate between knowledge classification and library classification.

3.0   MAIN CONTENT

3.1   History of Knowledge Classification

Earlier attempt of classification was basically to organise human thoughts. Human generally likes to arrange things knowingly or unknowingly daily at home; school, church and other places to easily locate things or objects. Over the years, philosophers have been concerned about the classification of ideas and thoughts which can be termed "**knowledge classification**". Early philosophers group ideas based on the extent of mutual relationship and they went further in arranging these ideas sequentially.

The origin of the term classification is derived from the Latin word *classis* which is used in the Roman Empire to group people based on their wealth and social status. To understand the classification process, it is important to consider the following:

1. Classification is based on objects or things that must be group or divide.

2. Classification is based on the grouping or dividing objects or things according to their likeness (similarity) and unlikeness (difference). Before embarking on the process of classification, it is pertinent to take into consideration the characteristics of the objects or things that need to be grouped. For example, animals can be grouped or divided into mammals, amphibians, reptiles, invertebrates etc. so also plants can be grouped into shrubs, woody, grasses and trees.

3. Purpose: There are reasons why objects or things are grouped or divided according to their similarities and differences.

4. Mental Process: The process of classification involves a mental process.

3.2   Concept of Classification

Classification started with the division of the universe of knowledge into various classes and subclasses based on selected characteristics. There are many schemes of knowledge classification that were produced or developed at a different time in history. Each of the schemes stands for the state of the universe of knowledge within that time. There are different types of knowledge classification developed by ancient philosophers and so there are philosophical classifications formulated before the 19th century and during the 19th century.

3.3   Development of Knowledge Classification

All of these were some of the knowledge classification developed by ancient philosophers;

1. Vedic Classification
2. Greek Classification
3. Scholastic Classification
4.   Baconian Classification
5. Kant's Dichotomic Classification
6. Hegel's Philosophical Classification or System
7. Hobbes's Philosophical Classification or System

8. Comte's Philosophical Classification or System
9. Ampere's Philosophical Classification or System
10. Spencer's Philosophical Classification or System
11. Wundt's Philosophical Classification or System

3.3.1 Vedic Classification

This is the earliest scheme of knowledge classification which is inscribed in **Upanishads**. This classification divided the universe of knowledge or ideas into four groups, namely;

1. **Dharma**: This group includes those subjects which are concerned with the maintenance of human society as a coherent organisation such as Law, Theology, Ethics and Sociology.

2. **Artha**: Include subjects needed for economic and social wellbeing. These are History, Political science, Economics and Applied sciences.

3. . **Kama**: These subjects include Literature, Fine Arts and Pure sciences.

4. **Moksha**: Include subjects like Philosophy and Spiritual experience.

3.3.2 Greek Classification

Greek philosophers are referred to as pioneers who made an effort to study the universe of knowledge. For example, Plato in his Republic divided knowledge into Physics, Ethics and Logic. While Aristotle in his Metaphysics divided knowledge into;

1. **Theoretical Knowledge**: Theology or Metaphysics, Mathematics, Physics.

2. **Practical Knowledge**: Ethics, Political science, Economics and Rhetorics.

3. **Productive Knowledge**: Applied sciences and useful Arts.

3.3.3 Scholastic Classification

This is also known as Medieval European Philosophical classification or system. The scheme was a university centred. The scheme divided the universe of ideas into 3, namely;

1. **Trivium**: Covered Logic (Dialectics), Grammar and Rhetoric.

2.   **Quadrivium**: Include Geometry, Arithmetic, Astronomy and Music.

3.   Theology, Metaphysics, Ethics and History.

3.3.4 Baconian Classification

Francis Bacon (1561-1626) studied the universe of ideas that existed at that time. It is worthy to note that, this scheme influences library classification. In the *Advancement of Human Learning* which was published in 1605, the universe of knowledge was examined using particular characteristics such as Memory, Imagination and Reason. From these characteristics emanated three subjects such as History, Poesy and Philosophy. These subjects were further subdivided into the followings;

History (Memory): Natural History, Civil History.
Poesy (Imagination): Narrative, Dramatic, Parabolical.
Philosophy (Reason): Natural Philosophy, Philosophy of Humanity, Civil Philosophy.
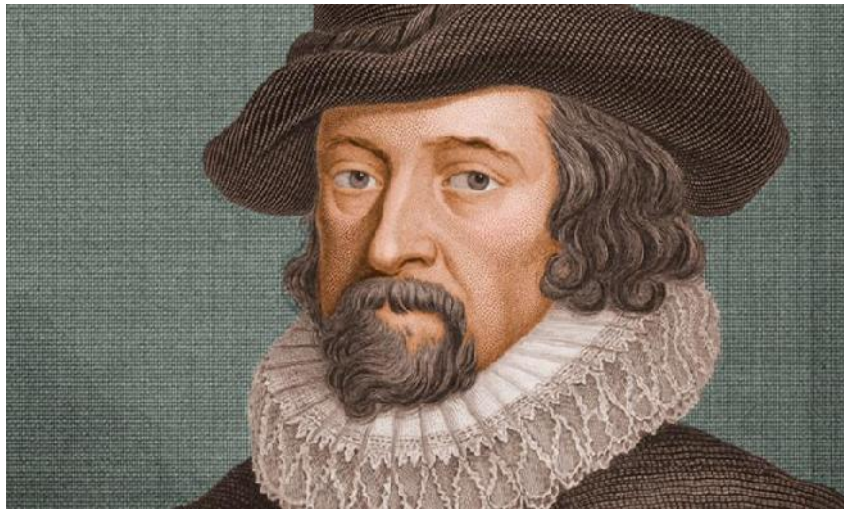
Figure 1: Francis Bacon : Source:
https://www.biography.com/scholar/francis-bacon

3.3.5. Kant's Dichotomic Classification

Immanuel Kant (1724-1804) is a great philosopher who described the dichotomic scheme of knowledge classification in his book, Pure Reason (1781). It is based on the approach that a given universe of entities can be divided into two groups based on primitive human instinct.
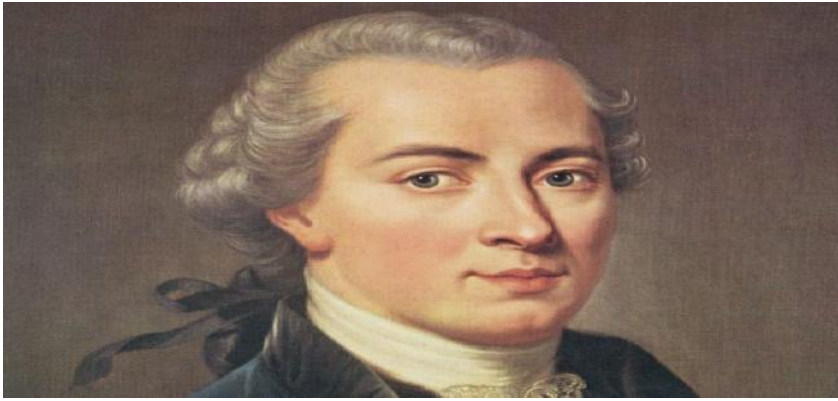
Figure 2: Immanuel Kant:
Source:https://medium.com/thedialogues/immanuel-kant-1724-1804-f736bafe364d

3.3.6 Hegel's Philosophical Classification or System

George Wilhelm Friedrich Hegel (1770-1831) described the Triadic scheme of knowledge classification in his book, Logic (1812), where he divided knowledge into;

i.   Logic: Ontology, Theology, Epistemology.
ii.   Natural sciences: Mechanics, Physics, Biological sciences.
iii.   Philosophy of Spirit (Psychology).

Figure 3. George Wilhelm Friedrich Hegel:
Source:https://slife.org/georg-wilhelm-friedrich-hegel/

3.3.7 Hobbes's Philosophical Classification or System

Thomas Hobbes (1588-1679) is an English thinker who described knowledge classification in his *Leviathan* (1651). He divided knowledge into;
i.   Mechanics, Engineering, Architecture and Navigation.
ii.   Science of Light (Applied optics).
iii.   Music (Science of sound).
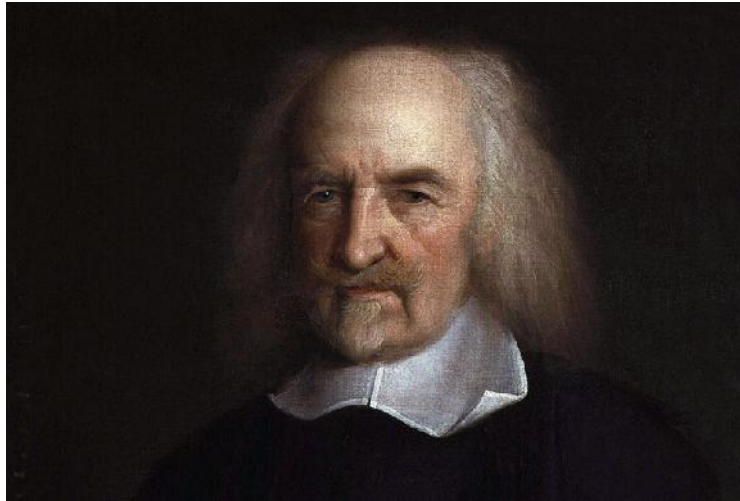
Figure   4.   Thomas   Hobbes: Source:https://www.the-tls.co.uk/articles/thomas-hobbes-footnotes-to-_Plato/

3.3.8 Comte's Philosophical Classification or System

Auguste Comte (1798-1857) gave an outline of his classification in his course *de Philosophe positive* (1830). The subjects are as follows; Mathematics, Astronomy, Physics, Chemistry, Biology, Social Physics (Sociology).

Auguste Comte was commended for establishing an order for fundamental science.

Figure 5. Auguste Comte: Source:http://www.yourarticlelibrary.com/sociology/the-contribution-of-auguste-comte-to-sociology/6246

3.3.9 Ampere's Philosophical Classification or System

Andre Marie Ampere (1776-1836) worked on his system of serial classification *Essa su Philosophe* (1834-43) as given below;

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Physic, Engineering, Geology, Mining, Botany, Agriculture, Zoology, Animal husbandry, Medicine.

Ampere's classification was commended because his classification was detailed and thorough more than other classification. It is known as the best serial scheme produced by 19[th]century philosophers.

Figure 6: Andre Marie Ampere: Source: https://soundcloud.com/user-387552167

3.3.10 Spencer's Philosophical Classification or System

Herbert Spencer (1820-1903) developed another serial scheme which was described in his classification of sciences (1864). The subjects include; Logic, Mathematics, Mechanics, Physics, Chemistry, Astronomy, Geology, Biology, Psychology and Sociology. Spencer is the first philosopher that made an effort to put together a theory of knowledge classification that guides the designing of a scheme of knowledge classification.
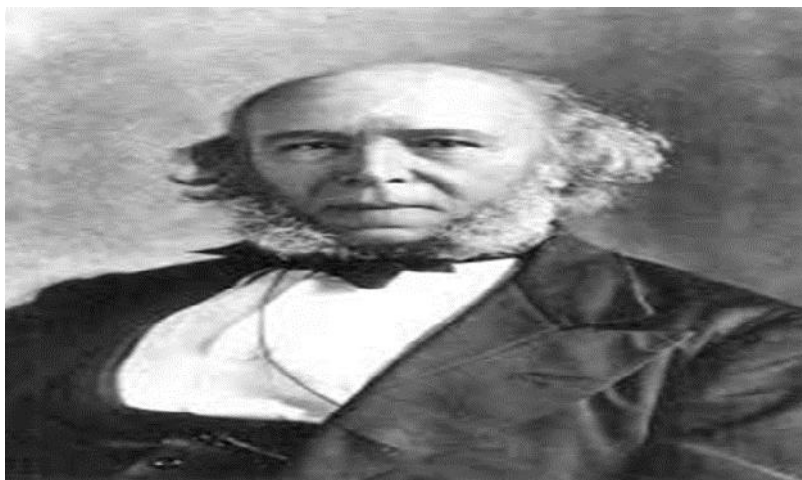
Figure 7: Herbert Spencer
Source: https://en.wikipedia.org/wiki/Herbert_Spencer

3.3 11 Wundt's Philosophical Classification or System

William Wundt developed modern psychology and the master of psychological sciences. He developed a system that classifies knowledge logically and completely. These are some main divisions described below;

System of Sciences
1.   Formal of Mathematical Sciences
2.   General and Special
3.   Real or Empirical Sciences
4.   Natural Sciences, Mental or Psychological Sciences

System of Philosophy
1.   Philosophy of knowledge- Formal Logic, Rear Doctrine of Knowledge,
2.   Philosophy of Principles- General Principles, Metaphysics; Special Philosophy.

Figure 8:   William Wundt: Source:https://edu.glogster.com/glog/wilhelmwundt/1u04mkkijo7?=glogpedia-source

Knowledge classifications concern with the division or grouping of all branches of knowledge. The overall reason for the grouping of ideas or knowledge is dependent on the degree of mutual relationship and according to a sequential arrangement. Through knowledge classification, early philosophers like Kant, Hobbes, Spencer etc. were able to communicate their ideas to others. Philosophers mainly focused on theoretical aspects of classification and as such the schemes were not detailed enough because they were produced for the sake of philosophers and their mental satisfaction. The scheme of knowledge classification does not have subdivisions and classmark or call numbers;

hence subjects cannot be systematically arranged. It is also worthy to note that the scheme of knowledge classification does not require Generalia, class, index, notation, form, book number and common isolate.

4.0   CONCLUSION

Knowledge classification involves the arrangement of ideas and thoughts based on mutual relationship. This led to the development of schemes of knowledge classification that is used by early philosophers in organising their thoughts and ideas which were communicated to other people. However, the schemes of knowledge classification were not detailed enough to classify books and other documents.

5.0   SUMMARY

In this unit, we have discussed the history and development of knowledge classification. We were able to briefly discuss some early schemes of knowledge classification developed by early philosophers such as;
Auguste Comte
Immanuel Kant
William Wundt
Herbert Spencer etc.

6.0   TUTOR-MARKED ASSIGNMENT

1.   Discuss the following schemes of knowledge classification;
      a. Vedic classification
      b. Greek classification
      c. Scholastic classification
      d. Baconian classification
      e. Hegel's classification
2.   Give reasons why schemes of knowledge classification were not detailed.

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MODULE 2   THEORIES AND NORMATIVE PRINCIPLES OF CLASSIFICATION

This module has four units which are aimed at teaching you the theories associated with the development of library classification and the normative principles of classification. The theories and normative principles are all the laws and orders to be followed in creating or developing suitable schemes for the classification of library materials for easy identification, storage and retrieval.

Unit 1   Classification Theories
Unit 2   Normative Principles of Classification - Canons for Idea Plane.
Unit 3   Normative Principle: Canon for Work at The Verbal Plane.
Unit 4   Normative Principle: Canon for Work at The Notational Plane.

UNIT 1   CLASSIFICATION THEORIES

CONTENTS

1.0   Introduction
2.0   Objectives
3.0   Main Content
        3.1   Concept of Theory
        3.2   Theory Classification and its Essence
        3.3   Types of Classification Theory
                3.3.1   Descriptive Theory
                3.3.2   Dynamic Theory
                3.3.3   Four Waves of Ranganathan's Dynamic Theory of Classification
4.0   Conclusion
5.0   Summary
6.0   Tutor-Marked Assignment
7.0   References/Further Reading

1.0   INTRODUCTION

You have learnt that Library classification is the process of grouping and assigning class marks to documentations or items acquired in the library collection for their easy identification by library staff and users using the classification schemes. The question you should ask yourself is this grouping done arbitrarily? How did the method of grouping and classifying come into existence? Who and who brought this method? This will introduce us the lesson of this unit "Theories of Classification"

2.0   OBJECTIVES

By the end of this unit, you will be able to:

- define the concept of theory.
- understand the theory classification and its essence.
- explain the types of theories of classification.

3.0   MAIN CONTENT

3.1   Concept of Theory

The theory is an organised body of knowledge or principles which controls or guides certain ideas or subjects which can be applied in solving problems. Thomas (2017:232) defines theory as a "description of a phenomenon and the interactions of its variables that are used to attempt to explain or predict '. Parsons in the same Thomas defined theory as a "system of laws". This suggests that theory is a set of rules or laws and principles guiding certain things or ideas. For these laws, principles and systems to become a theory they must have gone through different stages of growth and development. According to Wayer in Ud-Akang (2012) theory has four compliments namely;

- definition
- a domain of applicability
- a set of relationships of variables
- specific predication or factual claims

3.2   Theories of Classification and the Essence

Theory of classification can be defined as a formulated rules, laws and principles body of knowledge which controls, guides and direct the classifiers on the steps to follow in the grouping of documents into their main classes and their sub-divisions of classes for easy identification of each document in the library collection. In summary theories of classification are laws and principles guiding the activities of library classification. This theory was formulated because to help classifiers of documents into different subjects to solve day to day problems they may encounter in the process of assigning class marks. Theory of classification provided a scientific basis for the foundation of any subject showing that every subject assigned was not done arbitrarily it was based on laid out rules and findings. Theory of classification facilitates the acceptance of the subject as a discipline of study. For a body of knowledge to become a subject, it must be based on scientific principles from the theory of classification.

2.1   Types of Theories of Classification

The theory of library classification according to Parrkhi in Kumar (1979) in the second edition of *Prolegomena to the library to library classification* published in 1957 is divided into two as stated namely:

1.   Descriptive theory
2.   Dynamic theory

3.3.1 Descriptive Theories 1898 -1937

Descript theory as the name implies is the description of practices followed in the library classification. These practices were used as norms for the development of classification schemes. This descriptive theory existed in the 1950s based on no scientific principles but the norms were derived based on the taught and practises of the designers or developers of the classification schemes. This is the first theory of library classification. The theory was based on the universe of the subject that existed at that time. At this time there was no theory guiding the practice. Also, the number of subjects was little that the main classes covered the entire available subject. The descriptive theory followed the practice use in different existing library schemes but did not influence them. The descriptive theory was applied to the practices used in the scheme instead of using the theory to apply in the existing practising library classification scheme. It can be said that descriptive theory was manipulated to fit into the practice (Kumar, 1979). The following authors are responsible for the propagation of descriptive theory of library classification;

1.   James Duff Brown   - 1862 - 1914
2.   Ernest Cushing Richardson - 1901
3.   E. Wyndham Hulme - 1911 -1912
4.   Williams C. Berwick Sayers – 1881 – 1960
5.   Henry E. Bliss – 1929
6.   S. R. Ranganathan – 1937.

All these classificationists designed their schemes based on their aptitude and power of mind perceived from the truth of things without analysis or scientific proof. All the descriptive theories produced from 1898 to 1937 were based on guesswork. The followings are the descriptive theories;

3.3.1.1 James Duff Brown (1898 – 1914)

J. D. Brown was an English Librarian whose contribution to the development of the theory of library classification through the introduction of three schemes. The first was produced with J. H. Quinn in 1894 known as "Guinn- Brown" Scheme. The second was published in1897 known as "adjustable classification" which was inadequate during that time. The third was 1906 known as "Brown Subject Classification". Its second edition was in 1914 and the third edition in 1939. His classification theory was written in his book titled *Library classification and cataloguing* but the theory was applied in his title *Brown Subject Classification*.

The Brown theory of classification is based on two composite approaches. First was on the attempt to bring subjects that have multiple topics or interdisciplinary works together into the subjects it grew from or sprung up from. For instance, Islam should be placed under Religion, libraries under library economy and person under biography.

The secondly Brown subject classification scheme was based on the principle of "one lay theory" or one place classification where topics should not be scattered among different academic disciplines but brought together following order of things. This can be achieved through the use of notations in creating a composite class mark. Brown stressed on the order of creation of nature is based on matter and force followed by life, mind and record. The sequence of his main class is
Matter & Force
A –Generalia
B-D Physical Sciences
Life
E-F Biological Sciences
G-H Ethnology Medicine
I Economic Biology
 Mind
　　J- K　Philosophy& Religion
　　L　　Social & Political Science
Record
　M – N　　Language & Literature
　D – W　　History & Geography
　X　　　　Bibliography

Brown advocated that every concrete subject should have one constant place in the classification and can be subdivided into its various aspects or branches. This is because every subject grew up from a specific source and should not be divided artificially such as pure and applied sciences (Beghtol 2004)**.** Also Brown believes that no classification is

permanent or useful to everyone that at a certain time there is bound to be a failure or problem. He advocates that there is no problem in working out a complete scheme from any bases. The important thing is that specific subjects and their subdivisions be placed together or arranged together on the shelf.

3.3.1.2 Ernest Cushing Richardson (1901)

Ernest Cushing Richardson theory of classification was considered as the first systematic approach theory of library classification. His theory of classification was based on laws or principle. These laws or principles are canons that guide the designing or development of the scheme. The followings are his theoretical formulations as stated in Kumar (1979);

i.   The classification should follow as nearly as possible the order of things. The order to be followed is the order of complexity or history or order of evolution.

ii.   "Are real things calling for a place in the order of things"? He believes in using "order of things" in describing an existing knowledge that is, places of thing should be dependent on the position of other things or ideas. These principles were discussed in his edition of *classification, theoretical and practical* in 1901. Richard developed a scheme for Hartford Theological seminary.

3.3.1.3   E. Wyndham Hulme (1911 -1912)

Hulme was a librarian with patient office library London. He is popularly known for his theory of literary warrant. The theory of literary warrant emphasises that any existing knowledge must be provided with a class mark. The literary warrant stresses that subject can only be enlisted in a scheme only when it has available literature written on it. Meaning you do enlist a subject with a classmark when such a subject does not exist. For instance, if there is a book on *Marriage and childbearing,* there is a literary warrant for providing a number for such class Marriage and childbearing.

He published a book titled Principles of book classification in the Library Association Record. His contributions led to the development of complete and satisfactory theories of classification. His contributions are in two clusters namely

- mechanical
- Philosophical

Mechanical: this emphasised that boo classification is a plotting region of pr-existing literature and coincidence.

Philosophical: He advocated that there is no guarantee of accuracy in their philosophical order. He believes that books classification involves the mechanical arrangement of materials into classes. The formal and non- philosophical lines determine the division and coordination of classes in literature.

3.3.1.4   Williams Charles. Berwick Sayers (1881 – 1960)

William Charles Berwick Sayers is an English librarian and a teacher of S R. Ranganathan. His contribution to the theory of classification is grammarian of the library of classification. He simplified his theory of classification into 29 principles known as canons which are sets of rules or regulations guiding classification. These 29 canons of classification are grouped into six categories such as

- Canons of definition -------------6
- Canons of division ---------------7
- Canons of terms --------------------4
- Canons of book classification -----5
- Canons of notation -------------------4
- Canons of book classification schemes ----5

W. B. C. Sayers did not develop any classification scheme but his principles were used in the development of the schemes.

3.3.1.5   Henry Evelyn Bliss – 1870 - 1955

Henry Evelyn Bliss attended the city college of New York, 1910 he wrote a library journal article that announced his classification system but the outline of the system was done in 1935 and his four completed volume of the scheme was published between 1940 -1953.

Bliss theory of classification was based on scientific research, education and libraries. His scheme was based on theoretical principles although they were not fully implemented in practice. Bliss was based on five theoretical principles namely;

1. Consensus
2. collocation
3. Subordination
4. Alternative site
5. Notation

Consensus: Bliss sees book classification as simple knowledge classification. He believes in the majority opinion that there should be simple agreement among the experts on the arrangement of human

knowledge and its branches of knowledge. This he called scientific and educational consensus. Bliss emphasis that changes occurring in disciplines is rare at the level of major classes. Also, variation and innovation happen at the micro-level which is developed from previous disciplines. An example is Philosophy of Human nature – (developed into) Psychology.

Collocation: Bliss advocates the bringing of closely subject which are related together. In his bibliographic classification language is collocated with literature, education with psychology. Collocation means coordinating classes or subordinate classes. An example of how related subjects or discipline are kept together is
B - Physics
    BG   Properties of Matter
    Bs   Aerodynamics
    BT   Aviation and Aeronautics.

Subordination: Bliss advocates the use of subordination which should be of two kinds namely *subordination of the special to common* and *gradation through speciality.*

Subordination of special to common indicated that the arrangement of the subject in the scheme should follow the principle of decreasing extension. The common subject should be followed through a special subject.

Gradation through indicated that some subject depends on the findings or principles of other subjects. Where this is applicable such subjects that are dependent should follow the discipline which they depended on or rely on.

Alternative site: He advocated tat an alternative site should be created to enable the movement of topics to other classes. This shows that libraries can alter the sequence of the scheme o to suit its maximum usefulness. For example, theology can be moved from the main class P religion to class AJ following philosophy and sublimation of international law to political science or law. This principle allows for flexibility but it poses some problem in the organization. When such is practised there will be no consensus on the order of the subjects because every classifier is allowed to adopt a pattern that suits him. For instance, *Photography*: CFP – Y (Physical chemistry) or VR (art), OWT the *Businesswomen* or TJKW *Women in Business*

3.3.2 Dynamic Theory (By Shiyali, Ramarita Ranganathan1948 – 1955)

The dynamic theory is the second stage of development of classification theories after the descriptive theory which was rejected by **S. R. Ranganathan**. The bases of his rejection of library classification schemes designed during the period of the descriptive theory were that there was the library classification designed before the 1950s was based on no theory. Every classificationist developed his classification based on guesswork and individual experiences gotten from practising classification. The library classification schemes available then were descriptive. They are merely a list of all existing subjects and their main classes (enumerative). The earlier classification scheme did not provide placement of the subject in a helpful sequence. Also, it was the practice of classification that controls the descriptive theory instead of the theory guiding the practice. It is upon these deficiencies that S.R. Ranganathan advocated for a sound theory which introduced methodology into the development of schemes for library classification scheme.

The methodology allowed classificationists and classifiers to organize new subjects and existing subjects in their actual place in a helpful sequence. The dynamic theory was the brainchild of S. R. Ranganathan. The dynamic classification was published first in the second edition of *Prolegomena to library classification* in 1957 known as "describing the dynamic theory of library classification as Subject"; the third edition of the *Prolegomena to library classification* was published in 1967. The dynamic theory was not descriptive but uses the scientific method in the practice of classification. The era of guess-work used by classificationists in designing classification scheme was put to rest. The dynamic theory helped in tackling all the problems associated with the growing universe of knowledge and in the designing of more stable library schemes. It helped classificationists and classifiers in solving problems emanating from classificatory works. Ranganathan advocated that subject should be placed in the scheme of classification in a more helpful sequence.

The significant characteristics of Ranganathan of dynamic theory as stated by (2018) are
a)   It developed a set of normative principles to be applied to classification and designing of classification schemes easier and more systematic.
b)   It formulated three planes of work to use in the classification process. These planes of ideas are idea plane, verbal plane and notational plane.
c)   Maintain two catalogues (old and new catalgue0 and two sequences on the shelf.

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According to Tennis (2011), the list is in chronological order and represented the thinking of Ranganathan and his close circle collaborators and students.

3.3.3 Four Waves of Ranganathan's Dynamic Theory of Classification

S. R. Ranganathan theory has based the development of four waves of classification. These four waves are

1.   Faceted,
2.   Analytico-synthetic,
3.   Depth
4.   Abstract.

Faceted, analytico-synthetic, depth and abstract (FASDA) are the components of dynamic classification.

3.3.3. 1 Faceted Classification

(1924 – 49) is a method of breaking the universe of a subject into facets. The faceted classification was adopted from sayer's work and expanded based on the cannons by Ranganathan. The faceted classification lists all the main class or facets of every subject and provides rules for developing class number through the facet analysis. Ranganathan believes that any facet of the subject will fit into five fundamental categories namely personality, matter, energy, space and time. In using faceted classification according to Tennis (2011) you cannot add new facets in its proper place to allow new subject fall into a helpful sequence.

3.3.3. 2 Analytico-Synthetic Classification (the 1950s)

Ranganathan advocated the use of the analytico-synthetic approach in knowledge organization because of some deficiencies he noticed in Dewey Decimal Classification. Some of the deficiencies are that DDC did not treat the aspect of specific subjects extensively, and DDC at that time could not have enumerated all the existing subjects since it was based on the listing of all subjects based on certain characteristics alongside with their class number in a single schedule. The analytico-synthetic approach in knowledge organisation gave rise to the development of the Colon Classification scheme (7th Edition) by Ranganathan. Colon Classification had the provision for using points to estimate values to or predict unknown values for any (interpolate) new main subjects. The scheme also has provision for projection, extension or expansion (extrapolation) at the end of each species of digits. The last

digit of each species was postulated to be semantically empty (waiting for expansion) but retains its ordinal value. The classification uses concepts like isolate and facet in the division of main class (smaller units of ideas or entities). Facet is a term which represents the components of a basic subject (subjects that can stand alone), i.e., basic facet or an isolated facet of a compound subject. An isolate is any idea or idea complex to form a component of a subject but on their own is not a subject. Isolates are of two kinds – common isolates and special isolates. To understand what Isolate and facet consider this statement "***Comparative study of Buddhism and Jainism***" and "***Difference between democracy and Oligarchy***". In the first are two religious faiths belonging to the **Facet** or religion while the second is on **two isolates** of the same facet type in political science.

To create a class number using Analytico-synthetic approach of colon classification, the basic subject is named first, followed by isolates, which are entered according to a facet formula. This formula states that every isolate in every facet is a manifestation of one of the five fundamental categories -- personality, matter, energy, space, and time. Personality is the distinguishing characteristic of a subject. "Matter is the physical material of which a subject may be composed off. Energy is any action that occurs concerning the subject. Space is the geographic component of the location of a subject. And time is the period associated with a subject" (Panda, 2015:53)

CONCEPT OF PMEST (FUNDAMENTAL CATEGORY)
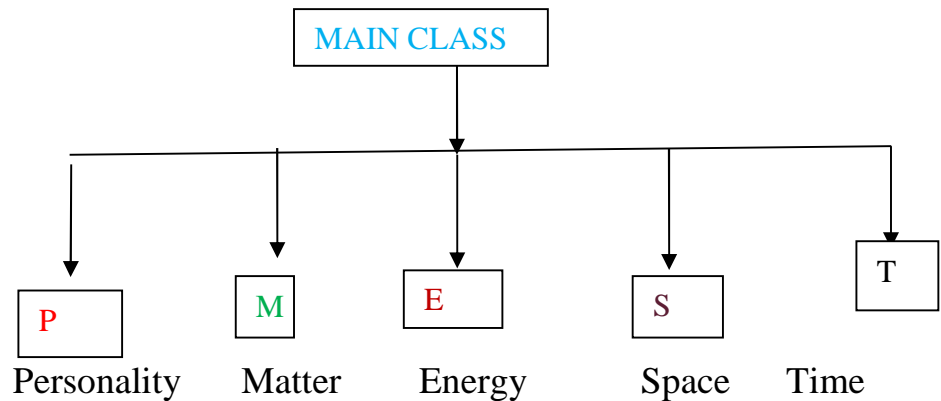
3.3.3.3 Depth Classification (1953)

This classification is based on the theory of whole or part-whole (W) analysis, quasi-analysis (Q1) focused on the domains which result in different zones and sectors notations. It advocated the adding of a large number of specific facets but the emphasis that the semantics of the digits present must be maintained. These digits must be filled in the proper sequence no matter how many they may be. Depth classification uses literary warrant approach. Depth classification is used in providing

a unique class number to any micro thought documents. Also, a term- in a compound phrase may form part of many combinations and it is only the depth classification's faceted nature, which provides complete flexibility in the coordination of terms (Kumbhar, 2003). It provides class numbers for specialized topics as well as for broad subject.

3.3.3.4 Abstract Classification (the 1960s)

This classification uses an empirical method of trial and error. It checks the shortcomings and functional requirements of a scheme using classification research to create models of classification. This is possible through the use of comparative research effort to expand the techniques needed by the classificationists in development of better schemes. Ranganathan advocated that abstract can be devised without reference to the content of the book or other library resources. For instance, the relationship between "pure Mathematics" and "Applied mathematics", Pure Mathematics model was prepared based on abstract principle without thinking about the actual phenomena. He believes that the existing or produce models are used in solving the problems associated with the existing subject of study.

The abstract classification has three classes namely;

a) *Artificial Abstract Classification*: this based on the characteristics found in a book which may not show reliable guide towards the subject matter but exposes elements such as names of authors, publisher, name of the printer, year of publication and place of publication

b) *Accidental Abstract Classification*: this is when such characteristics like colour of binding, size of the document, accession number which is not related to the subject content are used in classifying a book. In such classification numbers and symbols are used to link the materials to the shelf.

c) *Purely Abstract Classification*: this takes from the mathematical – linguistic model which helps in the evaluation of classification schemes. It is used for books, slides, pictures, phonograph recording which are arranged by the form in fixed location system.

4.0   CONCLUSION

The classification theories are rules and regulation or guiding principles developed by classificationists that found the bases used in the creation or development of library classifications schemes. All the laws and principles are aimed at achieving the objectives of organizing a vast wealth of knowledge available in the library collection for easy

identification and location of the documents. Theories of classification are geared toward achieving the five laws of library science.

5.0   SUMMARY

In this unit, you have learnt what is theory and its importance of essence, types of library classification theory which are divided into two namely descriptive and dynamic theories. You have also learnt different classificationists that propounded each theory and were they advocated for and how the theories can be used in the classification of books to assign a class mark. Now test your level of understanding by attempting the self-assessment exercise below.

6.0   TUTOR-MARKED ASSIGNMENT

1.   What do you understand by term theory?
2.   List three classificationists who propounded the descriptive classification theories.
3.   What is the name of the theory propounded by S. R. Ranganathan?
4.   Explain five components of fundamental categories.
5.   List the four waves of classification by Ranganathan.

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UNIT 2   NORMATIVE PRINCIPLES OF CLASSIFICATION

CONTENTS

1.0   Introduction
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        3.2   Three planes of work of Normative Principles: Canons for
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        3.8   Canons for Filiatory Sequence
4.0   Conclusion
5.0   Summary
6.0   Tutor-Marked Assignment
7.0   References/Further Reading

1.0   INTRODUCTION

In the previous unit, you have learnt about theories of classification and various classificationists. Also, you learnt about S.R. Ranganathan was propounded the dynamic theory of library classification which is used in the development of library classification scheme. Have wondered to ask yourself what principles or rules were used in the propounding these theories? Your guess will introduce us to the topic of today "Normative Principles of Classification".

2.0   OBJECTIVES

By the end of this unit, you will be able to:

•   define the concept of normative principles
•   outline the three planes of work of normative principles of classification as advocated by S. R. Ranganathan
•   discuss the normative principles of classification of canons for idea plane.

3.0   MAIN CONTENT

3.1   Concept of Normative Principles

The Normative principles are rules and laws adopted in the design and the use of the scheme for Library Classification is given in *Prolegomena to Library Classification*, 3rd edition (1967) published by S. R. Ranganathan. Colon Classification adopted this theory. The lists of the normative principles postulated at different levels are as follows;

Normative Principles by S. S. Ranganathan

S/N	Levels	Names of Normative Principles	Component of Each Normative Principles
1	The basic principle of thinking	Basic Laws	Laws of interpretation; Laws of impartiality, Law of symmetry, Law of parsimony, Law of local variation and Law of osmosis
2	Laws of Library Science	Fundamental Laws	"Books are for Use, Every Reader His book, Every Book Its Reader, Save the Time of the Reader and Library is a Growing Organism".
3	Canons	Classification	Canons for Characteristics, canon of Succession of characteristics, Canons for an array, Canons for chain and Canons for filiation sequence
4	A helpful sequence in an array	Principles of helpful sequence	Principle of later-in-time; Principle of later in- evolution, the principle of spatial contiguity, the principle of increasing quantity, the principle of decreasing quantity, the principle of increasing complexity, the principle of traditional sequence, the principle of decreasing literary warrant and principle of alphabetical sequence
5	Work of Classification	Postulates and Principles for Facet Sequence	The postulate of First Facet, Postulate of Concreteness, Postulate of Facet Sequence within a Round, Postulate of Facet Sequence with the Last Round and Postulate of Level and Level-Cluster

Table 1: **Normative Principles**

3.2   Normative Principles of Classification

Normative principles of classification as formulated by S.R. Ranganathan advocated the use of three planes of work for designing and application of classification schemes in the organization of knowledge this includes;
1.   Idea plane,
2.   Verbal plane
3.   Notational plane.

3.3   Canons for Idea Plane

The idea of the development of three planes arose with the need for the separation of work in the classification. The idea is thoughts but is modified when it fuses with the mind (Ghatowar, 2016). These ideas are transmitted through languages.

Importance of idea plane illustrated by Ghatowar (2016) is stated below

- Idea plane help in the arrangement of new concept/subjects in the chain for some isolates/ classes.
- Controls the work done in the verbal plane and notational plane.
- It recognises and determines the numbers of evolving and unknown subjects and placing them in a helpful sequence or order among the already existing subjects.
- Idea plane states the purpose and structure of the classification system.
- It pre-eminent and does not manifest directly.
- Idea plane serves as the theoretic basis for the foundation of knowledge organisation and classification system.

A scheme for classification must include these five concepts**;**

1.   Canons for Characteristics
2.   Canons for Succession of Characteristics
3.   Canons for Array
4.   Canons for Chain
5.   Canons for Filiatory Sequence

3.3.1 Canons for Characteristics

The canons for characteristics include the followings;
1.   Canon of Differentiation
2.   Canon of Relevance

3.   Canon of Ascertainability
4.   Canon of Permanence

3.3.1.1. Canon of Differentiation

Characteristics should be the basis for the classification of the universe considering some of the entities. Example "*Students*" characteristics can be "*Undergraduate or Postgraduate*". The further characteristics may be their faculty of study – "*Science, Arts, Management*". Under Science, another character can be "*Chemistry or Biology*"

3.3.1.2 Canon of Relevance

Characteristics use for the basis of classification of a universe should be relevant to the purpose of classification. That is irrelevant characteristics such as wealth, handwriting, the colour of hair and eyes should not be used for dividing the group of men for sports but some characteristics like height and weight can be used. So Literature is divided into, Main class, Language, Form, Author and Work.

3.3.1.3 Canon of Ascertainability

The characteristics used as the basis for classification of the universe should be definite and ascertainable. Example of using characteristics to divide the group of Professors their date of death will be impossible to determine and ascertain. But characteristic like Place of birth and year of birth can be used because they are ascertainable.

3.3.1.4 Canon *of Permanence*

The characteristics used for the basis of classification should remain unchanged so long as there is no change in the purpose of classification. A characteristic that undergoes frequent changes should not be used as the basis for classification. Example names of periodicals changes from time to time.

3.3.2 Canons for The Succession of Characteristics

Canons for the succession of characteristics include;

1.   Canon of Concomitance
2.   Canon of Relevant Success
3.   Canon of Consistent Succession

3.3.2.1   Canon of Concomitance

Two characteristics should **not** be used for a facet or object because it will lead to the same arrangement. Example use of **"***Age* and *Year of birth"* in classifying the **universe of "Girls"** is not allowed but "height *and physical strength*" can be used as characteristics in succession because it will not lead to the same arrangement.

3.3.2.2   Canon of Relevant Succession

Succession of the characteristics should be relevant to the purpose of classification. Every characteristic must be relevant to the objective of the classification. Examples Literature class in DDC uses a succession of characteristics of "*Language, Form, and Work* while Colon Classification uses "*Language, Form, Author and Work*" as succession characteristics for class Literature. All are used in the classifying books in the literature to ensure a helpful sequence on the shelf.

3.3.2.3   Canon of Consistent Succession

Success of the characteristics in a scheme of characteristics must be strictly followed so long as there is no change in the purpose of classification. Any change in the purpose of classification, the succession of characteristics should change to match with the change.

3.3.3 Canons for Array

The canons for array state that each array of classes in a scheme for classification should satisfy the following four canons. The canons for the array are applied to the classification of the universe of entities, the universe of basic subjects, the universe of isolate ideas, the universe complex subjects and universe of compound subjects.
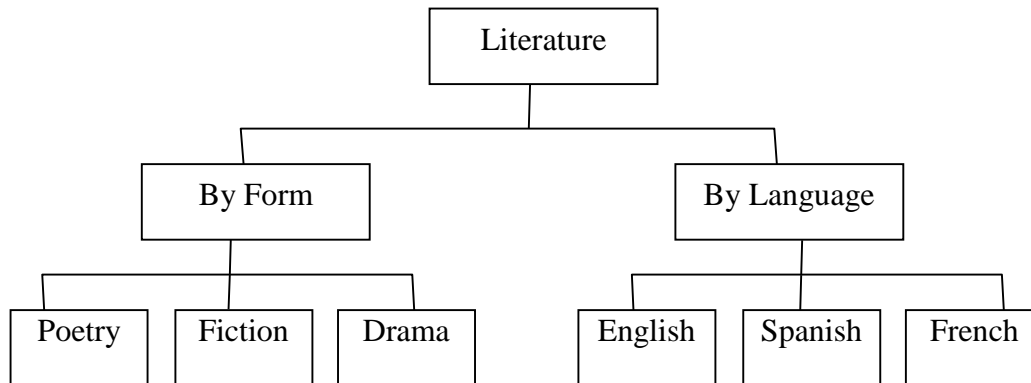
1.   Canon of Exhaustiveness
2.   Canon of Exclusiveness
3.   Canon of Helpful Sequence
4.   Canon of Consistent Sequence

*3.3.3.1*Canon of Exhaustiveness

It states that classes in an array of classes and the ranked isolates in an array of ranked isolates should be exhaustive of their respective common immediate universe.

3.3.3.2 Canon of Exclusiveness

The canon of exclusiveness states that classes in an array of classes and the ranked isolates in an array of ranked isolates should be mutually exclusive (Prolegomena: 160). This is possible when the classes are derived from its immediate universe using one and only one characteristics. It means that there should be no overlapping between the classes in an array. Example the subject Literature can be divided using two characteristics of Form and Language

```
                          ┌──────────────┐
                          │  Literature  │
                          └──────┬───────┘
               ┌─────────────────┴─────────────────┐
         ┌─────┴─────┐                       ┌──────┴──────┐
         │  By Form  │                       │ By Language │
         └─────┬─────┘                       └──────┬──────┘
      ┌────────┼────────┐               ┌───────────┼───────────┐
  ┌───┴──┐ ┌───┴───┐ ┌──┴──┐       ┌────┴───┐ ┌─────┴───┐ ┌─────┴──┐
  │Poetry│ │Fiction│ │Drama│       │ English│ │ Spanish │ │ French │
  └──────┘ └───────┘ └─────┘       └────────┘ └─────────┘ └────────┘
```

3.3.3.3 Canon of Helpful Sequence

The Canon states that "the sequence of the classes in an array of classes and the ranked isolates in an array of ranked isolates should be helpful to the purpose of those whom it is intended" (Prolegomena, p.163) Helpful sequence varies from one user's viewpoint to another. What one user sees as a helpful sequence might not be helpful to the other. Some of the users don't know the specific subject they need. They may name a narrower subject or the broader subject. So, a helpful sequence should display subjects so the users' approach or identify the subject from a broader to a narrower angle to the specific subject.

3.3.3.4 Canon of Consistent Sequence

According to the canon of consistent sequence states that "whatever similar classes or ranked isolates occur in different arrays, their sequence should be parallel in such arrays, what insistence on such parallelism does not run counter to other more important requirements" (Prolegomena: 164). The application of this canon in classification will help in achieving economy of time and mental effort. It reduces work had on the memory of a classifier and users. Example canon of consistent sequence can be achieved through the use of the same schedule to form an array in a subject.

3.3.4 Canons for Chain

According to Ranganathan, each chain of classes in a classification scheme should meet the requirements of the following canons:

1.   Canon of Decreasing Extension
2.   Canon of Modulation

3.3.4.1 Canon of Decreasing Extension

According to the canon of decreasing extension states that moving down a chain from its first link to its last link, the intension (internal content of a concept) of the classes should increase while the extension of the classes should decrease. Example**:**

        Africa   6
         Nigeria   66
        Abuja   6695

3.3.4.2 Canon of Modulation

A chain of classes should be made up of one class of every order that lies between the orders of the first link and the last link of the chain**.** It means that a wider class should come before a narrower class.
* World
* Africa
* Nigeria
* Lagos
* Abuja

3.3.5 Canons for Filiatory Sequence

The Canons that meet the requirements of filiatory sequence are:

1.   Canon of coordinate
2.   Canon of subordinate classes
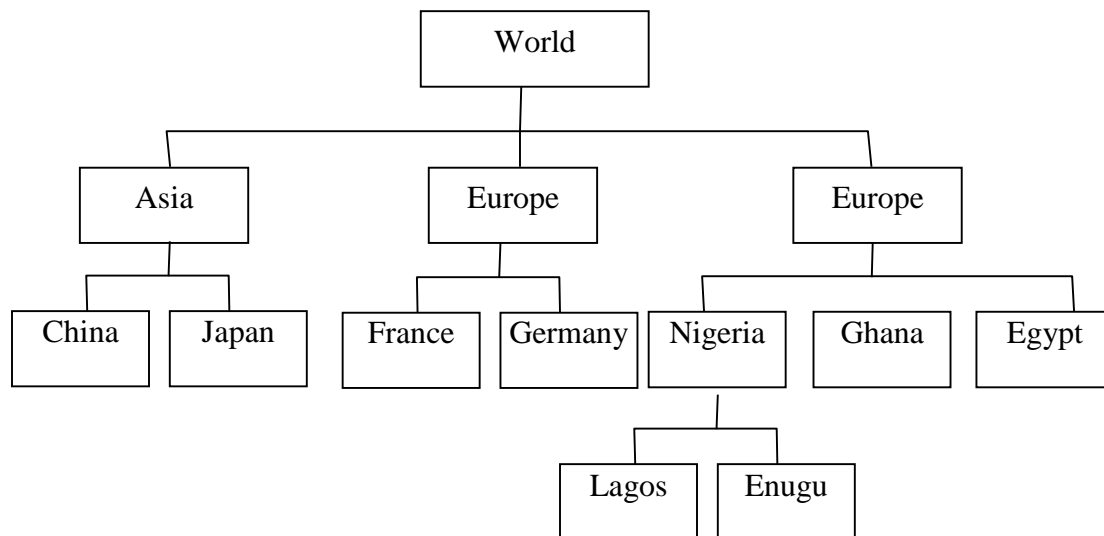
3.3.5.1 Canon of Coordinate Classes

Taking from the above examples "Nigeria, Ghana, and Egypt" originated in the same array (Africa) and had been consecutive in it, they should not be separated from each other by any class other than Lagos, Enugu and having Nigeria as their common immediate universe. This shows that in the canon of coordinate classes, among the classes in the

array, no class with less affinity should come between two classes with greater affinity.

3.3.5.2 Canon of Subordinate classes

It advocates that all the subordinate classes of a class in any chain they may occur should immediately follow it without being separated from it or among them by any other class. For example;

Canon for Subordinate Classes

```
                         ┌─────────┐
                         │  World  │
                         └────┬────┘
         ┌────────────────────┼────────────────────┐
    ┌─────────┐          ┌─────────┐          ┌─────────┐
    │  Asia   │          │ Europe  │          │ Europe  │
    └────┬────┘          └────┬────┘          └────┬────┘
     ┌───┴───┐           ┌────┴────┐      ┌────────┼────────┐
 ┌───────┐ ┌───────┐ ┌───────┐ ┌────────┐ ┌────────┐ ┌───────┐ ┌───────┐
 │ China │ │ Japan │ │France │ │Germany │ │Nigeria │ │ Ghana │ │ Egypt │
 └───────┘ └───────┘ └───────┘ └────────┘ └───┬────┘ └───────┘ └───────┘
                                          ┌───┴───┐
                                      ┌───────┐ ┌───────┐
                                      │ Lagos │ │ Enugu │
                                      └───────┘ └───────┘
```

For example, let us take the "original universe" by classes "world (array of order 0). Class "Asia, Class Europe and Class Africa belong to the array of order (1)and sub-class "China, Japan, France, Germany, Nigeria, Ghana belong to the array of order (2). the order of their merging elements to form one array of a whole consisting of classes in order of "Asia, China, Japan"; "Europe, France, Japan"; Africa, Nigeria, Lagos and Enugu"; then Ghana and Egypt. In the order of merging elements according to the canon of subordinate classes, if Nigeria, Lagos and Enugu are the sub-class of 3, originating in one or other of the chain from Africa, then classes of Nigeria and Lagos should follow Africa immediately

4.0   CONCLUSION

Normative principles are rules and laws adopted to help in the designing and the use of the scheme for Library Classification. These normative principles use scientific method base on the level of three planes which must be considered in designing of classification scheme. This level of three planes is Idea plane, Verbal plane and Notational plane.

Preview YouTube video Normative Principles and canons for work in the Idea Plane part 1: follow this link: https://youtu.be/XFfdgjpv5oU**or**

5.0   SUMMARY

In this unit, you have learnt the meaning of normative principles which included basic principle of thinking (basic Laws) laws of library science, canons, a helpful sequence in an array and work of classification. Also, you learnt about the normative principles of classification which are the laws and laws to be adopted in the classification of the subject which are based on the level of three planes are advocated by S. R. Ranganathan. The first stage of the level Idea of Plane was discussed in this unit. Refresh   your   learning   through   using   this   link: https://www.slideshare.net/umravsinghthakur/canons-of-library-classification (Canons of library classification" by Singh, U. 2016). The canon for work at the Verbal which is the second stage will be discussed in the next unit.

6.0   TUTOR-MARKED ASSIGNMENT

1.   Define the term normative principles.
2.   Outline the three planes of work of Normative Principles of Classification.
3.   What are the principles of Idea planes as advocated by S. R. Ranganathan?

7.0   REFERENCES/FURTHER READING

Denton, W. (2016). Ranganathan's prolegomena to library classification. Miskatonic University Press. https://wwmiskatonic.org.

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UNIT 3   NORMATIVE PRINCIPLE: CANON FOR WORK AT THE VERBAL PLANE

CONTENTS

1.0   INTRODUCTION

You have learnt that there are three level planes of works advocated by S. R. Ranganathan to help in the classificationists in designing and application of classification schemes in the organisation of knowledge which include idea plane, verbal plane and notational plane. You learnt about the idea plane, its components, importance and applications in classification. In this unit, you will learn what work of verbal plane is comprised of its terminology, problems and solutions.

2.0   OBJECTIVES

By the end of this unit, you will be able to:

- understand the concept works of verbal plane
- define the verbal plane terminology.
- discuss the four canons of terminology
- outline some of the problems of a verbal plane.

3.0   MAIN CONTENT

3.1   Concept of Canon for Work at the Verbal Plane

The verbal plane is the second stage in the classification process. It involves the express of individualized thoughts – content and ideas in words or terms. The verbal plane is the terminology used in the library classification schedule. These terminologies are thoughts in the field of library classification theory. Ranganathan in Ghatower (2016) defined terminology as a system of items used in naming classes or rank isolates in a scheme of classification. This shows that terms used in schedules

should be technical terms which are currently used by a specialist in their diverse subjects. Terminology is the name given to the classes and the sets of ordinal number use in representing the classes. This ensures that all the classes in any classification scheme must certainly have a given name for identification.

Some the problems lead to the development of verbal plane are that there is vagueness in meaning of ordinal words use in representing classes because one word may change due to the tones in pronunciation and gesture. This will result in having two words that have the same term (**spelling**) but different meaning. Such words are called homonyms. Examples of such term's words are "dog **bark** and tree **bark" and "bank** of a river **and** commercial **bank"**

Likewise, there are two words with different terms but the same meaning and they are called synonyms. Synonyms examples are "Smart and Clever", Important and Essentials".

3.2   Canon of Terminology

To remedy the problems associated with the use of natural language in naming terms Work at the Verbal Plane (naming and terms) was developed by S. R. Ranganathan based on four cannons of terminology in his book prolegomena to library classification in `1967. These four canons of terminology are as follows:

1.   Canon of Context Chain
2.   Canon of Enumeration
3.   Canon of Currency
4.   Canon of Reticence

3.2.1. Canon of Context

The canon of context states that naming of the term in a scheme for classification should be determined in the light of the different classes or ranked isolates of lower-order belonging to the same primary chain as a class. For example, terms like management, disease, gold, steal can occur in different subjects. For you to decide the class number of a book, one has to go through the context in which the term "Management" has been used in the book before you use the schedule to assign the class.

3.2.2 Canon of Enumeration

According to this canon, the denotation of a term in the scheme for classification should be determined through its sub-classes or ranked isolates which are enumerated in the various chains having the following

their common link. This shows that in expressing each term in a scheme of classification, it should be done considering the classes enumerated in the various chain (lower link)having the class denoted or expressed by the term as their common first link.

Canon of Enumeration
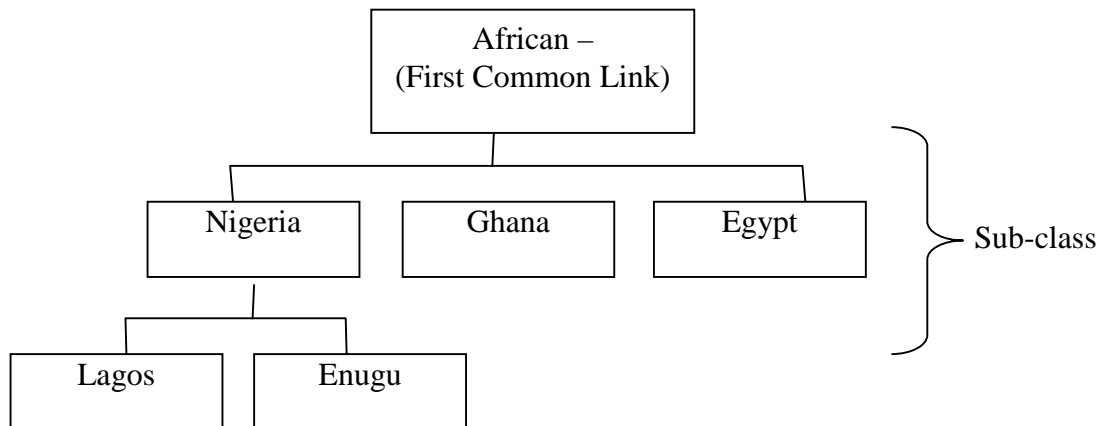
(Classes enumerated in the various chain are Africa their common Link, followed by Nigeria, then Lagos and Enugu showing the Lower Link)
This means that in agreement with the denotation of terms a user using a scheme should determine the denotation of any term in the scheme by referring to "each class ranked isolate and the chain of sub-classes as shown in the scheme to be comprehended by it(*Prolegomena*: 211).

3.2.3 Canon of Currency

This canon states that the term used in denoting a class or ranked isolate in a scheme for classification should be the one current among those specialists   in   the   subject-field   covered   by   the scheme(Prolegomena:214). This means that the terms to be included in the designing of the scheme for classification should be current and not obsolete terms. The specialist in the field of the subject area is in a better position to know current terms in their subject area. Where the terms or ranked isolate in the scheme becomes outdated, the schedules of the scheme should be revised constantly. This canon implies that the subject headings of the catalogue should be evaluated constantly to effect the revised terms to be current and relevant.

3.2.4 Canon of Reticence

The canon of reticence states that terms used to denote or expressed a class or ranked isolates in a scheme for classification should not be critical. That it should not be an expression of opinion of the classificationists who are the designer of the classification scheme. For

an example a term "minor author" was used in Dewey Decimal Classification is not line with the canon of reticence because a person who is considered as Minor author today may become a "major author" tomorrow. This means that the scheme has to change the terminology and relocate the class number.

4.0   CONCLUSION

In library classification, Ranganathan identified that the use of natural language in classification scheme is imperfect because of vagueness in the meaning of ordinal words used in day to day communication. these natural language keeps on changing in meaning to avoid these shortcomings and the problems associated with it in classification Ranganathan formulated the canons for work at the verbal plane which includes canon of context, canon of enumeration, canon of currency and canon of reticence.

5.0   SUMMARY

In this unit, you learnt about the canon for work at the verbal plane and its components which is the second stage in the three-level planes of works propounded by Ranganathan to help in the organization of knowledge in the library classification schemes. in the next unit, you will learn the last stage of the canon for work which Notational plane. you can refresh study through this recommended link https://www.youtube.com/watch?v=UIaVEMqlqds(Canons of terminology by Vidya-Mitra 2015) before answering the self-assessment exercise to evaluate your learning.

6.0   TUTOR-MARKED ASSIGNMENT

1.   Explain the concept works of a verbal plane.
2.   Define the term verbal plane terminology..
3.   Discuss the four canons of terminology.
4.   Outline some of the problems that lead to the development of the verbal plan.

7.0   REFERENCES/FURTHER READING

Ekere, F. C. & Mole, J. C. (2014). *Theory and Practice of Cataloguing and Classification.* Enugu: Praise house of publishers. 231.

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UNIT 4   NORMATIVE PRINCIPLE: CANON FOR WORK AT THE NOTATIONAL PLANE

CONTENTS

1.0   INTRODUCTION

In the previous unit you have learnt that there are three level planes of works advocated by S.R.Ranganathan to help in the classificationists in designing and application of classification schemes in the organization of knowledge namely; idea plane, verbal plane and notational plane. You learnt about the canons for works at idea plane and verbal plane. Today you will be learning about canons for works at the notational plane, its features and its canons used in the development of classification schemes. In this unit, you will learn what work of notational plane.

2.0   OBJECTIVES

By the end of this unit, you will be able to:

- understand the concept works of notational plane.
- explain the features of notational plane.
- define the basic canons of notational plane.

3.0   MAIN CONTENT

3.1   Concept of Notational Plane

The notational plane is ideas represented by ordinal numbers or symbols of the mark in a scheme of classification. The notational plane is concerned with the group of symbols, technically applied, which stands as a code in representing the subject contained in the classification schedules of classification scheme (Ekere and Mole 2014) The Notation

Plane as defined by Ranganathan(1967) in his book Prolegomena page 232 in the context of classification is a " number forming a member of a notational system" also he said that it is a " system of ordinal numbers used to represent the classes in a scheme for classification".

The notation is applied in the classification process to ensure that subject is filled at the rightful place in a helpful sequence. The notational symbols are letters, numbers and other symbols use in representing subjects which come in the form of "shorthand". In the library of congress classification scheme the code or notation for "Technology is T" while in the Dewey Classification Scheme the subject "Technology is 600". In the notational plane, the use of synonyms and homonym is absent.

3.2   Features of Notational Plane

The followings are the features of works at the notational plane;

- The notational plane uses symbols to replace words
- These symbols have a distinct or precise meaning.
- Notation plane does not use homonyms and synonyms.
- It is aimed at developing a set of ordinal digits and the rules to guide their usage.
- Concepts are represented by numbers
- Notational plane makes use of the artificial language of ordinal digits which help in the arrangement of documents and resources in the library.

3.3   Basic Canons for Notational Plane

The notational system used for the classification of the universe of subjects should be in line with the basic canons for notation. The basic canons for notational planes are:

1.   Canon of Synonym
2.   Canon of Homonyms
3.   Canon of Relativity
4.   Canon of Uniformity
5.   Canon of Hierarchy
6.   Canon of Non- hierarchy
7.   Canon of Mixed notation
8.   Canon of Pure Notation
9.   Canon of Faceted Notation
10.   Canon of Non – Faceted Notation
11.   Canon of Co-Extensiveness
12.   Canon of Under- Extensiveness

3.3.1 Canon of Synonym

States that no subject or isolate idea should be represented with two class numbers and isolate number in isolate ideas in a system of isolate numbers should be unique. This means that each subject should be denoted by one and only one class number and each isolate idea provided with a unique isolate number.

3.3.2 Canon of Homonyms

Ranganathan advocated that no class number or isolate should be used to denote or represent two or more subjects. It implies that each isolate should stand for only isolate idea while each class should stand for only subject.

3.3.3 Canon of Relativity

The canon of relativity states that the length of notation in a scheme should be in line with the depth or intension of the subject. This means that the number of digits in a class number should be the same as the order of the subject as may be represented by it.

3.3.4. Canon of Uniformity

The canon of uniformity states the number of digits, that is the length of the notation in a class should be constant (unchanging) irrespective of the order of the subject.

3.3.5 Canon of Hierarchy

Canon of hierarchy implies that "in a class number or an isolate number, there should be a digit to represent each of the characteristics used in constructing the class number or the isolate number as the case may be" (*Prolegomena:* 211). This means that each of the characteristics used in forming a class number or the isolate must be represented by successive digits in the class number. For example, using DDC, "500" represents Pure Science" then the subdivision of Pure Science is "Biology -574, Botany -581, Zoology – 591" all these subdivisions are represented by three digits. For this example, you will discover that "500 represented "5" appeared in all the subdivision representing the characteristics of "pure science" in all the subdivisions and all are represented by three digits.

3.3.6 Canon of Non- Hierarchy

Canon of non-hierarchy is opposite of canon of hierarchy it states that "in a class number or an isolate number there **need not** be a digit to

represent each of the characteristics used in constructing the class number or isolate number, as the case may be"(*Prolegomena*:227). Library of Congress Classification Scheme and Bliss Classification embraced this canon.

3.3.7 Canon of Mixed Notation

The canon of mixed notation states that the base of the notational system of a scheme for classification should use two or more species of digits" (*Prolegomena*: 282).

3.3.8 Canon of Pure Notation

The canon of mixed notation states that the base of the notational system of a scheme for classification should use only species of digits" (*Prolegomena*: 282).

3.3.9 Canon of Faceted Notation

Canon of Faceted Notation should apply when the length of the base of notation is about 10 and the universe is may contain more than million or more entities or subjects. Also when the length of the base is about 56 and the universe is likely to contain 1,000 million or more entities of the subject" (*Prolegomena*: 285).

3.3.10 Canon of Non – Faceted Notation

Canon of Non – Faceted Notation should be adequate. The length of the base of notation is about 10 and the universe is likely to contain no more than a million entities or subjects. Also, when the length of the base is about 56 the universe is likely to contain no more than 1,000 million entities" (*Prolegomena*: 285).

3.3.11. Canon of Co-extensiveness

Ranganathan advocated that "in a class number, digit should be added successively to represent the measure of the incidence of even the very last characteristics in the succession of the characteristics admitted by the universe classified and relevant to the purpose of classification" (*Prolegomena*: 287). This implies that even the last characteristics in the succession of the characteristics of the subject admitted by the universe being classified should be represented in line with the relevant purpose of classification.

3.3.12. Canon of Under- Extensiveness

Canon of Under- Extensiveness says that in a class number, it is not essential that the digit should be continued to represent the measure of the incidence of the later characteristics in the succession of the characteristics admitted by the universe classified and relevant to the purpose of classification" (*Prolegomena*:287).

4.0   CONCLUSION

To develop an efficient classification scheme based on scientific methods, all the levels of the three planes must be considered. The use of the three planes will help to solve the problems associated with the classification of the universe of knowledge. It will enhance the placement of subject content in the library shelf in a helpful sequence for easy identification and retrieval by library staff and users.

5.0   SUMMARY

In this module, you have learnt about the three levels of works of normative principles of classification propounded by S.R.Ranganathan which are canons for Idea plane, Canon for at the verbal plane and canon for work at the notational plane. When these three planes are applied in the designing of schemes of classification, idea plane will help in the generation of groups which is class, the verbal plane will help in denoting or signing names which are subject and notational plane will guide the assigning of numbers to a class of subject (call number).

6.0   TUTOR-MARKED ASSIGNMENT

1.   What do you understand by term works of Notational Plane?
2.   Explain the features of Notational Plane.
3.   List five basic canons for notational planes you know?
4.   These three planes are applied in the designing of ----

7.0   REFERENCE/FURTHER READING

Ekere, F. C. & Mole, J. C. (2014). *Theory and Practice of Cataloguing and Classification.* Enugu: Praise house of publishers. 231

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MODULE 3   UNDERSTANDING CLASSIFICATION AND LIBRARY CLASSIFICATION SCHEMES

This module introduces you to the concept of classification schemes and the various types of classification schemes used in libraries.

Unit 1   Concept, Features and Functions of Library Classification
Unit 2   Types of Classification Schemes
Unit 3   Dewey Decimal Classification Scheme
Unit 4   Library of Congress Classification Scheme

UNIT 1   CONCEPT, FEATURES AND FUNCTION OF CLASSIFICATION SCHEMES

CONTENTS

1.0   Introduction
2.0   Objectives
3.0   Main Content
        3.1   Concept Classification
        3.2   Concept of Library Classification
        3.3   Concept of Library Classification
        3.4   Purposes of Library Classification
        3.5   Features of Library Classification Schemes
4.0   Conclusion
5.0   Summary
6.0   Tutor-Marked Assignment
7.0   References/Further Reading

1.0   INTRODUCTION

You have been seen students grouped according to their classes or courses they are studying. When you enter any market, you will discover that the places they displayed items are not the same. People selling textiles are staying together; people selling food items stay together, people selling medicine also stay together. Have you asked yourself why these people are not scattered everywhere? The answer is that they are group according to the items each is selling. This will bring us to the topic of this lesson Classification and Classification Schemes.

2.0   OBJECTIVES

By the end of this unit, you will be able to:

* define the concept of classification.
* understand the concept of library classification.
* explain the purposes of library classification.
* describe the features of library classification schemes.

2.0   MAIN CONTENT

3.1   Concept Classification

Classification is a word which originated from a Latin word "Classis" meaning "Grouping". Classification is the process of grouping similar entities together while unlike entities are separated together. According to Ekere and Mole (2014:71), "classification is the grouping of things according to their degree of similarity and differences". Tiwari (2012) sees classification as a division of the universe of subjects into near-homogenous groups of subjects and arranged into groups in a preferred helpful sequence. This grouping tends to place subjects that have the same uniform, attributes, compositions and ability together. The universe of the subject indicates that the classification should be done based on the characteristics or attributes of the subject embodied in the document and the dissimilarities among the subject should be identified and recognised. Also, Satija and Martinez-Avila (2015) see classification as a tool used in an organization for grouping of objects into classes or categories considering their shared properties to bring like items together. For example, human beings are classified according to their geographical origin such as Nigerian, Italian, German and Indians. Foods you eat are classified into six classes namely carbohydrates, minerals, protein, vitamins, water, fats and oil.

3.2   Concept of Library Classification

Library classification as defined by Sayer in Gaur (2013:2) is the arrangement of books on shelves or description of them in a manner which is most useful to those who read it. "Usefulness" here connotes that with the arrangement on the shelves, users can search for the books and retrieves them without much difficulty. A library classification is activities which allow librarians or classifiers to allocate or assign a class mark to every item in the library based on their subject treatment or contents. It can also be defined as a systematic way of arranging information resources in a library through assigning numbers and alphabets which links related items together for easy identification by users of the library. The class marks assigned to the items gather all the

related items together on the library shelves. The inventors or developers of library classification schemes are called **classificationists** while the people who use the classification schemes in classifying books are called **Classifiers**. The objectives of library classification in organisation of knowledge in a library are

- To bring all related and similar subjects together for easy identification by   their users
- To help librarians bring and place all related and similar subject content together on the library shelves.
- The classmark given to every subject creates a link between document item on the catalogue and the library shelves.
- That is the classmark enables the item to be traced or located easily retrieved through the library catalogue whether online or offline.

The classification of information resources in the library brought in orderliness into the huge of collection collected in space, shelves or cartons in the library. The orderly arrangement of these information resources is not done arbitrarily. It follows a sequence to achieve the laws of library science as propounded by S. R. Ranganathan. The Laws of Library Science are

"Books are for the Use (1ST Law)
Every book his book (2nd Law)
Every book its reader (3rd law)
Save the time of the reader (4th Law)
The library is a growing organism (5th Law)".

The sequence followed in achieving these laws is the classification of library resources based on their subject treatment using the content coverage of any information resources. You may be asking why these information resources not classified according to their titles are. The answer is that if books are classified using their titles related subject content may be separated from each other using some of the classification schemes. For example, a book on "Introduction to Physics" may be placed together with "Introduction to Cataloguing and Classification" because of the title "Introduction" using the alphabetical order of arrangement. The use of the titles will arrange to be so large and cumbersome this will bring confuse and waste of time of the library staff and users in organization and retrieval processes.

When you try using the publisher in classifying, there will be many groups with little titles under them. Also, library users may not know the information resources they need through the name of the publisher. Also if the publisher is a corporate body like the National Open University of

Nigeria, it will result to the large collection with all the books published by the group into one shelve irrespective of their content; this will result to total confusion and waste of time of library users in retrieving and re-shelving the consulted resources back to the shelves.

When the books are classified and arranged on the shelves using their authors, many library users will leave the library unsatisfied because they may not know the author of information resources they required and related books published in their area of interest will not be identified even when they know the author they are searching for. Also, the grouping in the library classification will be many with some the group have small titles.

The acceptable arrangement in library classification is the use of a subject approach. The subject approach brought all information resources with the same and related content coverage into one subject entities and closer proximity. This grouping allows library users to consult a whole group of information resources on a given subject both the ones known or unknown to them to satisfy their information needs. Also, to justify the use of subject in library classification experiences and observations from librarian indicate that users coming to use information resources usually ask for their information needs to be based on subject areas rather than authors.

3.3   Purposes of Library Classification

A library classification is among the library services provided to library users behind the scene. Library users do not see the processes involved but utilize the product of the process. This involves the use of a classification scheme in grouping the information resources acquired in the library into their subject related discipline or content coverage. The followings are the purposes of library classification Schemes namely

3.3.1 Maintaining a Sequence in the Library

Classification is aimed at arranging and bringing all classes that are closely related in their subject content together based on their mutual or common relationship. Here subjects which are not related are given separate class to differentiate them from like classes. The purpose of this systematic arrangement is to ensure that related subject contents are group together for easy access and retrieval by library users. Also, library classification schemes help to maintain a sequence in the library arrangement and remove confusion and waste of time of the users of books and the library staff.

3.3.2 Shelving and Re-shelving

The assigning of class marks all classes that are closely related in their subject content together based on their mutual or common relationship using the classification schemes help in the arrangement or shelving of documents in the shelves. When books and other reading materials are removed from the shelves to be read by users, the removed documents from the shelves must be replaced to where they were removed. This process can only be faster and easily done by using the library classification. These documents are replaced to their proper shelves using their classification classes and numbers they bear. This process of replacing the document to shelve is called re-shelving. Shelving and re-shelving of information resources are done by librarians and other library staff not by library users to avoid shelving a document to class it does not belong to.

3.3.3 Provision of Call Number

This a unique number assigned to every item in the library collection which serves as a true identity and address for that particular item. The call number of a book (item) includes the following information name of the author, the title of the item, edition where applicable; dates of publication and volume. The call number differentiates one item from the other among the library collections. The call number links the item in the library catalogue to library shelves through using the library shelve guide.

3.3.4 Addition of New Titles or Documents

When a library acquires new documents or titles, library classification helps the librarian and the library staff to place such new documents among the existing collections in the library if they belong to the existing class already classified in the library. For example, where you have a new book on Library Communication Systems and you already have an existing one on the shelve with this class number ***Z680.3-680.6 Library communication systems*** you do not need not worry about where to place them on the library shelve you just need to shelve it where the existing or related class is on library shelve.

3.3.5 Withdrawal of Document from the Stock

The library classification helps the library staff for easy withdrawal of documents from the library stock. The withdrawal exercise maybe when the document is needed by another user from another library that interlibrary loan when the documents are to be given out as gifts and during weeding of the library resources. The use of the library

classification makes these activities less cumbersome for the library staff.

3.3.6 Keeping Records of Activities

In the circulation section of the library staff uses the library classification in carrying out daily activities in the section such as in borrowing and returning of borrowed information resources, updating and maintaining of patron database showing which resources are borrowed by each patron and the date of return.

3.3.7 Provides Link to the Library Catalogue

The evolution of classification gave rise to the library catalogue. The library catalogue is the list of all the library holdings or collections. These listings are done using their class marks which are assigned to each subject. This catalogue may be online or offline. Classification enables the library users to use the library catalogue tracing the location of any information resources available library in shelve where they are placed or stored. Library classification assists library users in tracing and retrieving of information resources from the catalogue and library shelves.

3.4   Features Classification Schemes

Classification schemes use artificial language to represent subjects of the information resources for easy arrangement of the resources. The features of classification schemes are as follows;

3.4.1 Schedules

This refers to a list of all classification main classes division and subdivisions of the subjects and their associated notations. The schedules show the logical or sequential arrangement of all the subjects available in the classification schemes. The arrangement follows a hierarchical order showing the relationship of specific subject to their parent subject. All the classification schemes have schedules.

3.4.2 Notation

This is a system of symbols which is used in representing a subject of an information resource or a class for example "The arts fine and decorative arts 700 with its sub-division civic and landscape 710, Architecture 720 and Plastic arts Sculpture" using the Dewey decimal classification. These symbols called notation are used in representing the subject. These symbols may comprise of letters of alphabets and

numerals that are numbers. There two types of notation namely; pure and mixed notation. The pure notation is when only one type of symbol is used in the classification such as DDC that uses only numerals as can be seen from the above example. The mixed notation involves the use of both letters and numerals in classification an example is Library of Congress Classification scheme such class mark for Special Accounts and books is HF5681, while A.2 for Account current, .A3 Account receivable", so

"Special Accounts Current book will bear a class mark of HF5681.A2".

3.4.3 Index

This refers to the alphabetical listing of all the subject content using the scheme with their relevant class mark to identify each subject against other subjects. There are two types of index namely.

a)   A Specific Index: It is a systematic arrangement of classification terms in an alphabetical order, which provides a place for entry but does not show location for related entries.

b)   A Relative Index: The relative index is an attachment to the schedules use in book classification. It is arranged in an alphabetical sequence. The relative index brings together all the disciplines which were scattered in a subject using the classification schedules in one place. So it shows a term and its various aspects with another. The relative index as used in Dewey Decimal Classification is an alphabetical index which is used in searching for books or topics by classifiers and library users.

3.4.4 Form Divisions

Here knowledge presented in different forms is taken into considerations in the classification of the subject. The form division may be a textbook, dictionary, and encyclopaedia. The form representing the knowledge is placed with the subject. The number used in representing the forms of a book in classification is called Form division or sub-divisions or common -isolates. For example, Literature – Poetry, Prose, Fiction and Drama all are sub-divisions of Literature but there are not separated from their main class "Literature".

3.4.5 Tables

This is another tool used in the classification scheme with the schedules and index. Classification tables provide the list of symbols which are added to a class mark to make it more specific and précised.

A generalities class

This class in the classification schemes stand for all the books or items which have not been assigned any particular subject class which may be due to their content treatment. Examples are encyclopaedias, dictionaries, general bibliographies etc.

4.0   CONCLUSION

Classification as a tool used in an organization for grouping of objects into classes or categories considering their shared properties to bring like items together. Also, library classification is a systematic way of arranging information resources in a library through assigning numbers and alphabets to link related items together for easy identification by users of the library.

5.0   SUMMARY

In this unit, you have learnt the Classification the concept of classification and library classification. You have also learnt the purposes of library classification in the library both to the library staff and to you as a user. You can now explain the features of the library classification schemes. Let now assess your level of comprehension of these studies through attempting the self-assessment exercise below.

6.0   TUTOR-MARKED ASSIGNMENT

1.   What is Classification?
2.   What allows librarians or classifiers to allocate or assign a class mark to every item in the library based on their subject treatment or contents?
3.   Outline some of the features of Library Classification Schemes.
4.   Explain three Purposes of Library Classification.

7.0   REFERENCES/FURTHER READING

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UNIT 2   CONCEPT AND TYPES OF CLASSIFICATION SCHEMES

CONTENTS

1.0   Introduction
2.0   Objectives
3.0   Main Content
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        3.2   Types of Classification Schemes
        3.3   Advantages of Classification Schemes
        3.4   Disadvantages of Classification Schemes
4.0   Conclusion
5.0   Summary
6.0   Tutor-Marked Assignment
7.0   References/Further Reading

1.0   INTRODUCTION

In unit 1, you have learnt about the concept of classification, features and functions of classification. In this unit, you will learn about the concept of classification schemes, types of classification schemes, their advantage and disadvantages.

2.0   OBJECTIVES

By the end of this unit, you will be able to:

• define classification schemes
• list and explain the different types of classification schemes
• discuss the advantages of the different types of classification schemes
• discuss the disadvantages of the different types of classification schemes.

3.0   MAIN CONTENT

3.1   Concept of Classification Scheme and Need for Classification

We discussed in module 1 that classification is the grouping of things or object according to their likeness and difference. In this information age and with the advancement of information communication technology (ICT), knowledge is created every day on various subject areas and most times, subjects are updated with new information. To organise ideas and

thoughts in documents according to their subject, librarians or information professionals need to adopt tools or techniques that will enable classification of all library materials in such a way that they can be easily accessed and used. Earlier in this course, we have discussed what classification is, we will remind ourselves of what classification is and the need for library materials to be classified.

Classification is a systematic arrangement of ideas and object in a systematic order. However, library classification is concerned with the arrangement of documents, books, microfilms, photographs and records. It involves arranging book and non-book materials according to their likeness and difference. The following are reasons why information materials are classified;

1.   Information resources or materials such as books, documents, records, etc. are arranged to allow increased use of these materials by library users.
2.   . Classification of Library materials allows users to independently locate the needed information resources on the library shelves without any assistance from library professionals.
3.   It provides a comprehensive view of the library collections on a particular subject area.
4.   Library professionals employ a classification scheme that uses notations to represent subjects thereby making it easy for library users to identify and locate the needed information resources.
5.   Classification of Library materials encourage increased use of library collections and this satisfied the laws of library science developed by S.R. Ranganathan.
6.   It aids in the compilation of bibliographies.
7.   It allows for the addition of new books to the library collection. At intervals, libraries acquire new information resources and classification of materials helps in adding these newly acquired resources to the library's existing collection.

Now we are going to discuss what classification schemes are. A classification scheme is a technique or tool used for the arrangement of books or documents or other information resources in a systematic order. It involves describing books or information resources into classes or groups. These classes are dependent on the characteristics of each book.

Classification schemes in the context of the library are used to organise library resources such as books, computer files, manuscripts, CD-ROM and electronic resources according to their subject areas. This means that books of the related subject are shelved together for easy location in the library. Each of these information resources in the library is assigned a

special number called *Call Number*. This call number is used to differentiate each book from another. Classification schemes are therefore tools or techniques used by libraries to systematically arrange information resources and ensure easy access and retrieval of library resources by users of the library. Some of the functions of the classification of library information resources include;

1.   It helps in the location of books on the shelves
2.   It gives an idea of the total number of information resources owned by the library.
3.   It helps in weeding or removal of outdated information resources
4.   It gives room for the addition of current editions of books
5.   It saves the time and effort of the users and library staff.

At this point, you may ask of the different types of classification schemes used by libraries. The next sub-heading will discuss the various types of schemes use by libraries.

3.2   Types of Classification Schemes

There are different types of classification schemes used by different types of libraries. Some of these schemes are;

1.   Colon Classification (CC) scheme
2.   Universal Decimal Classification (UDC) scheme
3.   Bibliographic Classification (BC)scheme
4.   Moy's classification scheme
5.   Dewey Decimal Classification (DDC) scheme
6.   Library of Congress Classification (LCC) Scheme

3.2.1 Colon Classification Scheme (CCS)

The Colon classification was developed by late Dr.ShiyaliRamamrita Ranganathan. The first edition was published in 1933. The Colon Classification is a general scheme that is based on subject classification and it classifies all kinds of information resources such as books, periodicals, reports, pamphlets, microforms and electronic media in different types of libraries. The major building blocks of the scheme is in the subject schedule and the schedule of isolates belonging to the five fundamental classes or facets which was introduced in the firstly in the third edition. The five fundamental classes or facets include;

•   Personality
•   Matter
•   Power
•   Space
•   Time

Colon Classification is concerned with analysis and synthesis, no wonder why it is called the *Analytico-synthetic scheme of classification.* Late Dr.ShiyaliRamamrita Ranganathan was a seasoned librarian who dedicated his time and effort in furtherance of librarianship profession by formulation norms, techniques, laws and theories in the field of librarianship. For example, he wrote a book called **five laws of Library Science** in **1931**, in his book; he stated the five fundamental laws of Library Science. These laws are listed below;

1. First law: Books are for use
2. Second law: Every reader his/her book
3. Third law: Every book its reader
4. Fourth law: Save the time of the reader
5. Fifth law: Library is a growing organisation

Figure 1. Late Dr S. R. Ranganathan
Source:http://www.lislinks.com/photo/drranganathan?context=album&albumId=2013205%3AAlbum%3A18457

He also established the first Library Science school under the supports of Madras Library Association which was later managed by Madras University. Colon Classification is a breakthrough in the modern classification. The scheme is made up of 3 versions and 7 editions.
Version 1 (1933-1950): Rigidly faceted era contains CC1, CC2 and CC3.

Version 2 (1950-1963): Almost Freely-Faceted era contains CC4, CC5 and CC6.

Version 3 (1963-1987): Freely-Faceted Era comprises CC7.
The following are the editions of CC:

Editions   Year
1st Edition   1933
2nd Edition   1939
3rd Edition   1950
4th Edition   1952
5th Edition   1957
6th Edition   1960
7th Edition   1987

Colon classification 6th edition divided the entire universe of knowledge based on a subject into the following Main classes;

Z	Generalia
1.	Universe of knowledge
2.	Library Science
3.	Book Science
4.	Journalism
A	Natural Science
AZ	Mathematical Science
B	Mathematics
BZ	Physical Sciences
C	Physics
D	Engineering
E	Chemistry
F	Technology
G	Biology
H	Geology
Hx	Mining
I	Botany
J	Agriculture
K	Zoology
Kx	Animal husbandry
L	Medicine Illustrative
LX	Pharmacognosy
M	Useful Arts
	Spiritual experience and mysticism
MZ	Humanities and social science
MZA	Humanities
N	Fine Arts
NX	Literature and language
O	Literature
P	Linguistics
Q	Religion
R	Philosophy
S	Psychology
Ó	Social Science
T	Education

U	Geography
V	History
W	Political Science
X	Economics
Y	Sociology
Yx	Social Work
Z	Law

Colon Classification is made up of 42 main classes that combine letters, numerals and symbols. These classes are represented by Arabic numerals and Greek letters which means it has mixed notation. Colon classification uses many mnemonics such as verbal mnemonic, schedule mnemonic, systematic and seminal mnemonic. It has been used by libraries in India, while few libraries outside India make use of Colon classification. This is because most libraries see it as more of a theoretical scheme rather than practical.

3.2.2 Moys Classification Scheme

Late Elizabeth M. Moys started work on her Moys Classification for Legal materials as a project leading to her becoming a Fellow of the Library Association (Great Britain). Moys is a very handy classification scheme and it only covers one subject area namely, law. The first edition was published in 1968. Many new users of the scheme find it difficult to use it at first because the current edition (3rd edition) of the scheme provides very little guidance to its use, particular about number building using the tables. At the time of her creation of the classification, there was no Library of Congress Classification schedule for the subject "law". Her scheme arranges common law jurisdictions by topic (as does the Canadian adaptation of LCC's KF), and non-common law jurisdictions by jurisdiction (as does LCC). It has a dual notation: Class K, as in Library of Congress and 340 as in Dewey Decimal Classification. Due to the demand for a legal classification in Commonwealth countries, the 4th edition of Moy's scheme was published by Bowker-Saur, in printed format.

Figure 2. Elizabeth M. Moys (1928-2002)
Source:https://www.whosdatedwho.com/dating/betty-moys

The outline of the scheme is provided below:

General and Non-National Legal System
K   Journals and reference books
KA Jurisprudence
KB General and Comparative law
KC International Law
KD Religious Legal Systems
KE Ancient and Medieval Law
Modern National legal systems
Common-Law
Primary materials
KF Common Law, Primary Materials, British Isles
KG Common Law, Primary Materials, America
KH Common Law, Primary Materials, Australia
Treatises
KL   Common Law, Treatises, General
KM   Common Law, Treatises, Public Law
KN   Common Law, Treatises, Private Law
Other Modern Legal Systems
KP Preference Jurisdiction (Optional alternative)
KR   Africa
KS   Latin America
KT   Asia and Pacific
KW European Community Law
Optional alternative
KZ   Non-legal subjects.

The scheme makes use of tables to ensure specificity in the classification of information sources. Specific instructions (notes) on how each table should be used are also provided.
The tables are:

> I. Primary materials
> II. Subjects of Law
> III. Dates
> IV. Common Law Jurisdiction
> V. Courts
> VI. Special legal forms and topics
> VII. Persons
> VIII. Non-legal forms and treatments
> IX. European Communities Law

In addition to these tables, the scheme has appendices on Criminology, Nigerian States, their historical periods and cutter numbers from the index of Jurisdictions. Moys organizes law collections by their nature and jurisdiction that is primary sources, secondary sources, Law Reference and Law Journals. This enables easy access to Law and legal publications of a country needed by the users. In Nigeria's case, the scheme provides an appendix on legal information sources emanating from the Nigerian States, from independence to date.

3.2.3   Bliss Bibliographic Classification Scheme

The scheme was developed by a librarian called Henry Evelyn Bliss in 1935 and was published in four volumes between 1940 -1953 in the United States and mostly used by British libraries. It is a good example of a facet classification scheme that is used by all types of libraries due to its detailed structure. The Bibliographic term that appears on the title shows that the scheme is all-embracing or wide and is not only applicable for the arrangement of books on the library shelves but it is also applicable to subject catalogue, union catalogues, subject bibliographies and other special bibliographic services. The scheme is made up of 35 main classes which consist of 9 numerals and 26 alphabetical classes.

Figure3. Henry Evelyn Bliss
Source: https://www.geni.com/people/Henry-Bliss/6000000032395640111

The following are the main classes of BC

A-   Philosophy, General Science AM Mathematics
B -   Physics, Engineering
C -   Chemistry
D-   Astronomy, Geology, Physical Geography
E -   Biology, Biochemistry
F-   Botany
FW -   Agriculture
FY -   Forestry
FZ-   Animal & Industries
G-   Zoology
H-   Physical Anthropology, Medical Sciences
I -   Psychology
J-   Education
K-   Social Sciences, Ethnology
KT-   Geography (Human, Social and Economic)
L, M, N, O, P -   History
P -   Religion
Q-   Applied Social Sciences
R -   Political Science
S-   Law
T-   Economics
U-   Industrial Arts
V-   Fine Arts
W,X,Y-   Language and Literature

The notation system of BC includes the use of uppercase and lowercase Roman letters. It also uses Arabic numerals for common subdivisions. This means that the Bliss bibliographic classification uses mixed notation without the use of symbols. It also has schedules and index.

3.2.4 Universal Decimal Classification (UDC) Scheme

The Universal Decimal Classification (UDC) scheme was developed during the first international conference on bibliography held at Brussels in 1895. The *Institute Internationale de Bibliographie* (IIB) sponsored the UDC scheme originated by two Belgian, Paul Otlet (Advocate) and Henri La Fontaine (a senator). The purpose of the UDC scheme was to classify all published literature in a comprehensive index. Paul Otlet wrote a letter to Melvil Dewey requesting for permission to adapt his Dewey Decimal Classification scheme in developing the UDC scheme. Melvil Dewey obliged and grant Europeans the right to translate his scheme. In 1895, PaulOtlet and Henri La Fontaine had already classified 400,000 cards for their bibliography. The government of Belgium provided funds and appointed Paul and Henri as the secretaries of the institute. The name*, InstituteInternationale de Bibliographie* (IIB) was changed to *InstituteInternationale de Documentation* in 1931. In 1937, the institute assumed the present name, *Federation Internationale de Documentation* (FID).

The international edition of UDC scheme was published in German, Polish, English, Japan, French, Sweden, Dutch, Czech, Hungary, Italy etc.

Figure 4: Paul Otlet
Source: https://www.dailymail.co.uk/sciencetech/article-2156249/Paul-Otlets- idea-televised-book-foretold-internet-1934.html

Figure 5. Henri La Fontaine
Source: https://www.sunsigns.org/famousbirthdays/d/profile/henri-la-fontaine/

The UDC scheme is made up of 10 main classes from 0-9. The following are the 10 main classes of Universal Decimal Classification (UDC);
0 Generalities. Science and Knowledge Organization. Information, etc.

1 Philosophy. Psychology.,
2 Religion. Theology
3 Social Sciences. Economics. Law. Government. etc.
4 Vacant
5 Mathematics and natural sciences
6 Applied sciences. Medicine. Technology
7 The arts. Recreation. Entertainment. Sport
8 Language. Linguistics. Literature
9 Geography. Biography. History

Note: Class 4 had it former original subject linguistics merged with class 8. It was vacant to accommodate future development or subject.
Presently, there are various editions of the UDC scheme in various natural languages. UDC editions are in 39 languages based on the scope of subjects. The following are examples of UDC editions;

i. Full editions
ii. Abridged edition
i. Medium length editions
iv. Special subject editions.

UDC is similar to the DDC scheme because it adapted the structure of DDC. It can be used for classifying articles, monographs and other items. It is used bysed by libraries in different countries around the globe, however, it is mostly used by libraries in Europe, Latin America,

and Japan. It is also mandatory for Union of Soviet Socialist Republics (USSR) and other countries in Eastern Europe.

Recently, the United State of America (USA) and Canada are using UDC scheme as an alternative to LC. The class number of UDC appears on Machine Readable Catalogue (MARC) tapes and the scheme is used for abstracting and indexing services. The UDC scheme uses mixed notation which consists of numbers and letters or alphabets. The UDC is very popular internationally although it has some advantages and disadvantages.

3.3 Advantages of Universal Decimal Classification (UDC) Scheme

1. The scheme is flexible and can be used for classification of library materials and bibliographic classification.
2. It is cheap when compared to other available schemes.
3. It has a good hierarchical structure and can easily be used by the library staff in searching the library.
4. It helps in timely retrieval of items in a specific subject.
5. It reduces language difficulty because it uses standard international notation.
6. It is used for abstracting and indexing services.

3.4 Disadvantages of Universal Decimal Classification (UDC) Scheme

1. It has confusing or complex notations due to lack of specific filing order symbols.
2. It is the difficulty for library staff to file library materials using UDC scheme.
3. Library users find it difficult to independently search for materials using the UDC scheme.
4. Slow revision of the scheme.

4.0 CONCLUSION

overemphasised. There are various types of classification schemes used by libraries in different countries. It important for librarians to be familiar with all types of classification schemes to use the one that will meet their library needs. In Nigeria, libraries mostly use the Dewey Decimal Classification (DDC) and Library of Congress Classification (LC) scheme. In unit 2 and 3 of this module, we will discuss extensively, Dewey Decimal Classification and Library of Congress Classification scheme.

5.0   SUMMARY

In this unit, we have discussed four different classification schemes used by libraries around the world.

We discuss Colon classification scheme developed by Dr S. R. Ranganathan, a renowned librarian. The scheme has five fundamental classes or facets;

- Personality
- Matter
- Power
- Space
- Time

He also came up with the 5 laws of library science. Let me refresh your memory on the laws;

1.   First law: Books are for use
2.   Second law: Every reader his book
3.   Third law: Every book its reader
4.   Fourth law: Save the time of the reader
5.   Fifth law: Library is a growing organisation.

- We discussed the Bliss Bibliographic classification scheme that was developed by Henry Evelyn Bliss. The scheme is made up of 35 main classes which consist of 9 numerals and 26 alphabetical classes. This means that the Bliss bibliographic classification uses mixed notation. It also has schedules and index.
- We discussed the Moys classification scheme. If you remember, the scheme is used for the classification of only law collections.
- Lastly, we discussed Universal Decimal classification (UDC) which was developed by Paul Otlet and Henri La Fontaine. The scheme is very popular and has many editions and was currently published in 39 languages. One of the advantages of this scheme is that it is not only used for the classification of library materials but also the bibliographic classification.

6.0   TUTOR-MARKED ASSIGNMENT

1.   Discuss Colon classification scheme.
2.   Discuss the Bliss Bibliographic classification scheme.
3.   Discuss the Moys classification scheme.
4.   Discuss Universal Decimal classification scheme.

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CONTENTS

1.0   INTRODUCTION

In unit 2, you have learnt about some different types of library classification schemes. In this unit, you will learn about one of the major classification schemes that are popularly used in Nigeria. This scheme is called the Dewey Decimal Classification. We will discuss the scheme, its features, and the advantages and disadvantages of the scheme.

2.0   OBJECTIVES

By the end of this unit, you will be able to:

*   discuss briefly dewey decimal classification schemes
*   discuss the features of the DDC scheme
*   list the advantages and disadvantages of the DDC.

3.0   MAIN CONTENT

3.1   Dewey Decimal Classification Scheme

The Dewey Decimal Classification (DDC) scheme was developed by an American librarian, Melvil Dewey in 1876. The first edition of DDC was published in 1876 and titled: *A Classification and subject index for cataloguing and arranging the Books and Pamphlets of a library.* The first edition consists of 44 pages with 12 pages for introduction, 12 pages of schedules and 18 pages of index. It has grown from 44 pages in its first edition to 3000 pages in its 19th edition which was published in 1979. The 19th edition is in 3 volumes;

i.   Volume 1- Tables
ii.   Volume 2 – Schedules
iii. Volume 3- Relative index

The DDC has a manual on how to use DDC which was published in 1982. The scheme is currently at its 23rd edition published in 2011. The DDC is published in abridged and unabridged forms. The abridged form of DDC was published in 1979; it contains 618 pages and 2,179 entries. The abridged version also shortens numbers used in notation and it is designed for use by schools and public libraries. DDC uses pure notation, this means that it uses only numbers or numerals.
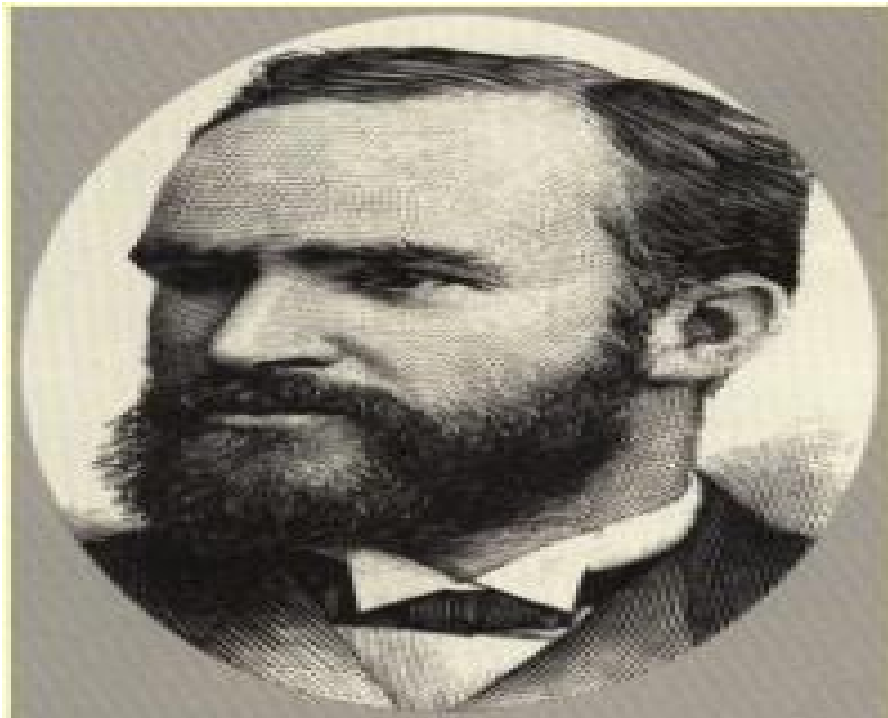

Figure 1. Melvil Dewey
Source: http://historyofinformation.com/detail.php?entryid=603

DDC is currently translated into over 30 languages such as Danish, Portuguese, Turkish, Japanese, and Hindi etc. DDC is hierarchical in nature and it proceeds from general to specific. Books or information materials are arranged by disciplines and a specific subject can appear in any number of disciplines. However, the relative index brings together different aspects of a specific subject.

DDC Editions from 1876-2011

Editions	Year of Publication	Number of Pages	Editors
1st Edition	1876	44	Melvil Dewey
2nd Edition	1885	314	Melvil Dewey & W.S. Biscoe
3rd Edition	1888	416	Melvil Dewey & W.S. Biscoe
4th Edition	1891	466	E. May Seymour
5th Edition	1894	467	E. May Seymour
6th Edition	1899	511	E. May Seymour
7th Edition	1911	792	E. May Seymour
8th Edition	1913	850	E. May Seymour
9th Edition	1915	856	E. May Seymour
10th Edition	1919	940	E. May Seymour
11th Edition	1922	988	J. Dorkas Fellows
12th Edition	1927	1243	J. Dorkas Fellows
13th Edition	1932	1647	J. Dorkas Fellows & M.W. Getchell
14th Edition	1942	1927	Constantin Mazney& M. W. Getchell
15th Edition	1951	716	Milton J. Fergusom
16th Edition	1958	2439	Benjamin A. Custer & D. Haykin
17th Edition	1965	2153	Benjamin A. Custer & D. Haykin
18th Edition	1971	2718	Benjamin A. Custer
19th Edition	1979	3385	Benjamin A. Custer
20th Edition	1989	3388	Benjamin A. Custer
21st Edition	1996	4115	J.P. Comaromi
22nd Edition	2003	4076	J. Mitchell
23rd Edition	2011		J. Mitchell

Table 2: Editions of DDC Scheme

3.2 Features of Dewey Decimal Classification (DDC) Scheme

Features of DDC scheme are as follows,

1. Main Classes
2. Hierarchy and Notation
3. Tables
4. Mnemonic:
5. Adaptability of Notation
6. Revision
7. Computerisation of DDC

3.2.1 Main Classes

Melvil Dewey grouped knowledge into 10 main classes arranged by disciplines and represented by Arabic numbers. DDC is a hierarchical scheme that classifies materials from the general to the specific. The notation usually consists of three digits by adding zeroes for the number to become three. Thus, the full number of any main class is three, for example, class 3 is 300. 300-399 represent social sciences. The following are the 10 main classes of DDC scheme;

000– Computer science, Information and General works
100–Philosophy and Psychology
200–Religion
300–Social sciences
400–Language
500–Sciences
600–Technology
700–Arts and Recreation
800–Literature and Rhetoric
900– History, Biography, and Geography

Each class above represents a broader discipline. However, class 000-099 is not the same as the other class. Class 000 is a general class used for works that their disciplines are specific. General works include Encyclopaedias, Newspapers, periodicals, Bibliographies, Library and information science etc.

- Class 100-199 covers philosophy and psychology
- Class 200-299 dedicated to religion.
- Class 300-399 covers the social sciences. This class includes sociology, anthropology, political science, economics, law, public administration, social problems and services, education, commerce, communications, transportation, and customs.
- Class 400-499 comprises language, linguistics, and specific languages.
- Class 500-599 is devoted to the natural sciences and mathematics
- Class 600-699 is dedicated to technology
- Class 700-799 covers the arts: art in general, fine and decorative arts, music, and the performing arts.
- Class 800-899 covers literature and includes rhetoric, prose, poetry, drama, etc.
- Class 900-999 is devoted primarily to history and geography

These 10 classes can be divided into 10 divisions. Take class 300-399 for example, class 300-399 covers social science discipline and is subdivided into;

300-309- Social science
310-319- Statistics
320-329- Political Sciences
330-339- Economics
340-349- Law
350-359- Public Administration and Military Science
360-369- Social Problems and Social Sciences
370-379-Education
380-389- Commerce, Communications and Transportation
390-399- Customer, Etiquette, Folklore
The above class division can be broken down or subdivided into 10 sections. For example, Education (370-379);

370- Education
371-School management; special education
372- Elementary education
373- Secondary education
374- Adult education
375- Curricula
376- Education of women
377- Schools & religion
378- Higher education
379- Government regulation, control, support

Each of the class division above can be further divided into more specific subjects using decimal point after the third digit as shown below. For example, class 371 School management; Special education;

371-School Management; Special Education
371.1 Teaching and teaching personnel
371.2 School administration and management
371.3 Methods of instruction and study
371.4 Guidance counselling
371.5 School discipline
371.6 Physical plant
371.7 School health and safety
371.8 The student
371.9 Special education
Another example is 372 Elementary education;

372- Elementary Education
372.1 Organisation and management of elementary schools; curriculums
372.2 Levels of elementary education
372.3 Technology, science, health
372.4 Reading
372.5 Creative and manual arts

372.6 Language, literature, theatre

372.7 Mathematics

372.8 Other studies

372.9 Historical, geographic, person's treatment of elementary education

3.2.2 Hierarchy and Notation

DDC uses decimal fraction notation for the arrangement of knowledge or books according to discipline and subject area on the library shelves. As earlier discussed, the Dewey Decimal Classification (DDC) scheme has 10 main classes, 100 divisions and 1000 sections. The scheme moves from the general to the specific. For example,

600 Technologies

630 Agriculture and related technologies

636 Animal husbandry

636.3 Sheep and goats

636.4 Swine

636.5 Poultry Chickens

636.6 Birds other than poultry

636.7 Dogs

636.8 Cats

In the above numbers, the first, second and third digits represent the main class. 600 for all general works in technology represent the main class, 630 is used for general works in Agriculture, 636 is used for animal husbandry. Sheep, Goats, Swine, Chickens, Dogs and Cats" are more specific than the umbrella term "Animal husbandry" because they are subdivisions of animal husbandry. "Animal husbandry" is in a superior category and less specific than Sheep, Goats, Swine, Chickens, Dogs and Cats.

3.2.3 Tables

The Dewey Decimal Classification is made up of seven (7) tables. These tables are;

I. **Table 1: Standard Subdivision**: Subdivisions are used to complete class number wherever necessary. They do not stand alone because they are preceded by a dash (-) and zero. However, if the three digits of the main class number end with zero, it will not be necessary to add zero. The several methods of treatment of a subject are shown below;

Table 1: Standard Subdivision
— 01 Philosophy and theory
— 02 Miscellany
— 03 Dictionaries, encyclopaedias, concordances
— 04 Special topics
— 05 Serial publications
— 06 Organizations and management
— 07 Education, research, related topics
— 08 History and description to kinds of persons
— 09 Historical, geographic, person treatment

For example, 526 Mathematical geography; 526.07 represent study and teaching of Mathematical geography. On the other hand, 530 represent (Physics) and -07 represent (study and teaching of Physics), the classmark, therefore, is 530.7 and not 530.07.

Another instance, 512 is for "Algebra", -03 is for "dictionaries, encyclopaedias and concordances". Therefore, 512.03 is for Dictionary of Algebra. 601 is for "Philosophy and Theory", and 05 is for "serial publication". Therefore, 601.05 is for Journal of Philosophy and Theory. 612.6 is for "Reproduction, development, maturation", and -05 is for "serial publication", hence, 612.6 + -05 is equal to 612.605 which is interpreted as "Journal of Reproduction, development, and maturation.

II. **Table 2: Geographical Areas, Historical Periods, Biography**: Table 2 helps you to identify the time or period, region and place relating to the work or title of a book. It also represents the geographical area in the world. The methods of treatment of a subject are shown below;
—1 Areas, regions, places in general; oceans and seas
—2 Biography
—3 Ancient world
—4 Europe
—5 Asia
—6 Africa
—7 North America
—8 South America
—9 Australasia, Pacific Ocean islands, Atlantic Ocean islands, Arctic islands, Antarctica, extra-terrestrial worlds

Like Table 1.Table 2, notations are not also used alone and they are preceded by a dash (-). Notations in table 2 are only used as directed by the DDC schedule. You should note that standard subdivision (-09) must be added to the main class before area notation. For example, the number for "Agriculture" is 630, to get the notation number for Agriculture in Nigeria; you need to add -09 to the base number 630. Since the number ends with zero, you only need to add 9. Then looking

at table 2, Africa is -6, when you add it, it gives us 630.96 for Agriculture in Nigeria.

III. **Table 3: Subdivisions for Arts, for Individual Literatures, for Specific Literary Forms**: This table list different forms of literary works such as poetry, fiction, drama, etc. The notations of the table are;
—1 Poetry
—2 Drama
—3 Fiction
—4 Essays
—5 Speeches
—6 Letters
—7 Humour and satire
—8 miscellaneous writings

IV. **Table 4: Subdivisions of Individual Languages and Language Families**: This type of notation is used to show language and they are using only when required. The notations of the table are;
— 1 Writing systems, phonology, phonetics of the standard form of the language
— 2 Etymology of the standard form of the language
— 3 Dictionaries of the standard form of the language
— 4 -
— 5 Grammar of the standard form of the language
— 6 -
—7Historical and geographic variations, modern nongeographic variations
— 8 Standard usage of the language (Prescriptive linguistics)

I **Table 5: Ethnic and National Groups**: Table 5 is used in representing ethnic and nations. It is also used as instructed by the schedules and the other tables. Numbers can be added directly by an instruction. The notations of the table are;
– 1 North Americans
– 2 British, English, Anglo-Saxons
– 3 Germanic people
– 4 Modern Latin peoples
– 5 Italians, Romanians, related groups
– 6 Spanish and Portuguese
– 7 Other Italic peoples
– 8 Greeks and related groups
– 9 Other ethnic and national groups

II. **Table 6**: **Languages**: Table 6 provides numbers to be add whenever it is instructed in the schedules or other tables. This allows language to be added as a part of many subjects. The notations of the table are;

– 1 Indo-European language
– 2 English and Old English (Anglo-Saxon)
– 3 Germanic languages
– 4 Romance languages
– 5 Italian, Sardinian, Dalmatian, Romanian, Rhaeto-Romanic
– 6 Spanish and Portuguese
– 7 Italic languages
– 8 Hellenic languages
– 9 Other languages

VII. Table 7: Persons: Notations in this table covers various categories of the person such as male, female, children, and adults etc. who may be part of the subject of the book.

-01 Individual persons
-02 Group of persons
-03 Person of racial, ethnic, national background
-04 Person by sex and kinship characteristics
-08 Persons by physical and mental characteristics
-09 Generalists and Novices

However, it is worthy to note that this table was **deleted** and replaced by the direct use of notation already available from the schedules.

3.2.4 Mnemonic

This is an important aspect of DDC that serve as 'memory aids. There are many memory aids such as standard division table, area table, and language table which are used for subject synthesis. The use of consistent order in the subject division of different classes produces mnemonics.

3.2.5 Adaptability of Notation

DDC can be used for complex or broad classification as well as specific. The scheme can be used by all types of libraries both general and small libraries due to its abridged and unabridged edition.

3.2.6 Revision

The DDC scheme full and abridged editions are modified and revised through a publication known as *decimal classification, additions, notes and decision.*

3.2.7 Computerization of DDC

In 1988 DDC became a division of Online Computer Library Centre (OCLC). The advent of information communication technology has brought about a computer-based editorial support organisation and

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database that is used to produce Dewey Decimal Classification 20 and 21 editions. DDC 21 edition is made up of print and electronic formats. The electronic format uses Windows, and Microsoft Windows TM-based version; but currently, DDC is not in only printed format but a web-based format. Through the web-based format, professionals can have access to an improved version of the DDC database which is available through Web Dewey. Currently, DDC is being taken care of by the Online Computer Library Centre (OCLC).

Advantages of the Dewey Decimal Classification (DDC) Scheme
The following are some of the advantages of the DDC Scheme according to Clark (1999);

1. DDC schedules give clear directions on how to use it for number building.
2. DDC arrange concepts ina consistent order and allocated consistent notations. For example, 423 is English dictionaries, 433 is German dictionaries.
3. The scheme allows unlimited expansion after the decimal point to allow for complex subjects.
4. The notation is arranged in hierarchical order from general to specific. For example, 495.6 Japanese is a subdivision of 495 and 495 is a subdivision of 490.
5. Schemes like the Library of Congress provide catalogue cards with pre-assigned DDC numbers.
6. DDC is kept up-to-date by DDC additions, notes and publications.
7. DDC helps in locating books easily on the library shelves.
8. The DDC relative index helps to bring together related ideas which are separated in the classification scheme.
9. DDC is widely used by libraries in the world.
10. The scheme can be used by different sizes of libraries because of it abridge and unabridged edition.
11. It is easier to understand since it was developed by a seasoned professional.

Disadvantages of Dewey Decimal Classification (DDC) Scheme

The following are some of the disadvantages of the DDC scheme;

1. DDC is made up of only ten main classes resulting in lengthy classification numbers making it difficult for small libraries to use.
2. Inconsistent numbering in the DDC scheme is another problem to libraries. For example, classes 400, 800 and 900 are closely related yet separated.

3. The arrangement of classes is confusing because of the separation of major-related subjects like language and literature.
4. DDC is not as easily expandable and as such may not be able to accommodate new subject areas.
5. The repetition of subdivisions in the DDC schedules in most cases confuses classifiers.

4.0   CONCLUSION

Dewey Decimal Classification scheme is a popular scheme use by various libraries around the world. It is used by large and small libraries due to abridged and unabridged edition and its simple notation. Despite some of the disadvantages of the DDC scheme, many libraries still use it due to its constant availability of various editions and it is also in machine-readable catalogue. The scheme can also be accessed online on web Dewey.

5.0   SUMMARY

In this unit, we discuss the DDC scheme. The founder of the scheme is Melvil Dewey, a renowned librarian. The scheme is currently at its 23rd edition published in 2011. It is made up of 10 main classes arranged by disciplines and represented by Arabic numbers. It is currently being translated into over 30 languages. It consists of features such as tables, mnemonics, adaptability of notations and constant revisions. Irrespective of its widespread use, the scheme has some disadvantages such as the repetition of subdivisions and non-expandability of the scheme.

6.0   TUTOR-MARKED ASSIGNMENT

1. Discuss the Dewey Decimal Classification scheme.
2. List the 10 main classes of DDC scheme.
3. Briefly discuss the 5 features of DDC scheme.
4. List five advantages of DDC scheme.
5. List four disadvantages of DDC scheme.

7.0   REFERENCES/FURTHER READING

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UNIT 4   LIBRARY OF CONGRESS CLASSIFICATION (LCC) SCHEME

CONTENTS

1.0   INTRODUCTION

In unit 3, we discuss the DDC scheme, its features, advantages and disadvantages. In this unit, we will discuss another popular library classification scheme called Library of Congress Classification. We will discuss the scheme extensively, its features, advantages and disadvantages.

2.0   OBJECTIVES

By this end of this unit, you will be able to:

- discuss the scheme
- discuss the features of LCC scheme
- list the advantages
- enumerate the disadvantages of LCC scheme

3.0   MAIN CONTENT

3.1   Library of Congress Classification (LCC) Scheme

The Library of Congress was established in the year 1800 when the American legislature was preparing to move from Philadelphia to the new capital city of Washington, D.C. The scheme was meant for the arrangement of the collection according to size and by accession number till 1812 when British soldiers set fire on the Capitol, and 35,000 volumes out of 55,000 volumes of the Library of Congress's collections were destroyed. In 1815 Thomas Jefferson sold his collections that had

6,487 books to the Library of Congress. Hence, the Library of Congress adopted the format of Thomas Jefferson'sclassification system and made some modifications to the system until the nineteenth century. It is important to note that, Thomas Jefferson's classification system was adopted from Bacon's Classification of Knowledge.

In 1897, the Library of Congress shifted to a new building with over one and a half million volumes of books. In 1899, Herbert Putnam was appointed the Librarian of Congress and the largely developed the library of Congress classification scheme. Herbert Putman felt that existing classification schemes should be used in replacement of the scheme used by the Library of Congress because of its inadequacies. Hence, the Catalogue Division was allocated to continue with the development of a new system of classification under the direction of J. C. M. Hanson and Charles Martel, Chief Classifier. The existing schemes like Dewey Decimal Classification, C. A. Cutter's Expansive classification, and German Halle Schema were scrutinised but none of these schemes was found suitable for classification of Library of Congress collections. Therefore, a new scheme was developed bearing in mind the growth of the collections and the needs of various subject departments. Plans were made and an outline of each class and schedules were designed according to how books on the shelves were arranged. The existing schedules have been expanded and revised to accommodate new materials or books that will be added to the Library of Congress collections. The name of this new scheme is called Library of Congress Classification (LCC) scheme and work began on the scheme in 1901 and the first volume (E-F- American History) was published. In 1902, the second volume (Z- Bibliographies and Library Science) was published. However, the first outline of the LC scheme was published in 1904. Other schedules of LC were published in 1948 except class K for Law. The first Law schedule (Law of United States) of LC was published in 1969and the last Law schedule (KB- Religious Law) was published in 2004.

Figure 1:Jens Christian Meinich Hanson
Source:https://www.luther.edu/library/about/collections/special/jcmhans/

Figure 2: Charles Martel
Source: https://en.wikipedia.org/wiki/Charles_Martel_(librarian)

The LC scheme was initially made for just Library of Congress collections only and not for any other libraries in the world. It is based on a ***literary warrant*** of the late19th and early 20th century. The main subject divisions were by the department of the library of congress and as such the scheme is not in line with the scientific order of subjects. The LC scheme has its schedule and index but not a general index. Even though the scheme was meant for the library of congress, it has been adopted and used by libraries all over the world. However, in Nigeria, the LCC scheme is mostly used by colleges and university libraries. Each schedule of LCC has its main classes, sub-classes or a group of sub-classes. The library of congress directed the development of Machine-Readable Catalogue (MARC) format in the 1960s for the exchange of information about bibliographic materials. Since inception, the scheme has been in printed format until 1993 when it was converted from print format to MARC format. However, since 2013 till date, the LCC printed format was converted to the online version which made available the PDF version of LCC schedules. With the availability of online version, LCC and Library of Congress Subject Heading (LCSH) schedules alongside with the instructions on how to use these tools can be accessed freely online. The web or online LCC scheme is reliable, saves times and easy access to schedules and tables.

LC classification is an enumerative scheme that uses 21 letters of the 26 letters of alphabets to represent classes and subject areas. I, O, W, X and Y letters are not yet in use but are kept to accommodate future subjects' additions. Capital letters are used to denote main or broad classes, while

subdivisions use two capital letters. Further subdivisions or subtopics are denoted by cutter numbers thereby making use of decimals. Hence, the LCC scheme uses mixed notation because it uses both letters and numbers.

3.2   Features of Library of Congress Classification Scheme

The following are features of the LCC scheme;

1.   Main Classes
2.   Schedules
3.   Notation
4.   Index
5.   Mnemonics
6.   Revision

3.2.1 Main Classes

The following are the 21 main classes of Library of Congress Classification Scheme;

Class	Discipline
A	General Works
B	Philosophy. Psychology. Religion
C	Auxiliary Sciences of History
D	World History and History of Europe, Asia, Africa, Australia, New Zealand, etc.
E	History of the Americas
F	History of the Americas
G	Geography. Anthropology. Recreation
H	Social Sciences
J	Political Science
K	Law
L	Education
M	Music and Books on Music
N	Fine Arts
P	Language and Literature
Q	Science
R	Medicine
S	Agriculture
T	Technology
U	Military Science
V	Naval Science
Z	Bibliography. Library Science. Information Resource (General)

These main or broad classes are further subdivided into subclasses by using two alphabets as shown below; For example, let us use class L and R.

L: Education
L: Education (General)
LA: History of education
LB: Theory and practice of education
LC: Special aspects of education
LD: Individual institutions - United States
LE: Individual institutions - America (except the United States)
LF: Individual institutions – Europe
LG: Individual institutions - Asia, Africa, Indian Ocean islands, Australia, New Zealand, Pacific Islands
LH: College and school magazines and papers
LJ: Student fraternities and societies, United States
LT: Textbooks
R: Medicine
R – Medicine (General)
RA – Public aspects of medicine
RB – Pathology
RC – Internal medicine
RD – Surgery
RE – Ophthalmology
RF – Otorhinolaryngology
RG – Gynaecology and Obstetrics
RJ – Paediatrics
RK – Dentistry
RL – Dermatology
RM – Therapeutics. Pharmacology
RS – Pharmacy and materia medica
RT – Nursing
RV – Botanic, Thomsonian, and Eclectic medicine
RX – Homeopathy
RZ – Other systems of medicine
These classes are further broken down into division or specific subject classes by combining two letters. For example, the following are divisions of subclass LB and RD.
Subclass LB theory and practice of education

LB5-3640	Theory and practice of education
LB5-45	General
LB51-885	Systems of individual educators and writers
LB1025-1050.75	Teaching (Principles and practice)
LB1049.9-1050.75	Reading (General)
LB1050.9-1091	Educational psychology
LB1101-1139	Child study

LB1139.2-1139.5	Early childhood education
LB1140-1140.5	Preschool education. Nursery schools
LB1141-1489	Kindergarten
LB1501-1547	Primary education
LB1555-1602	Elementary or public school education
LB1603-1696.6	Secondary education. High schools
LB1705-2286	Education and training of teachers and administrators
LB1771-1773	Certification of teachers
LB1775-1785	Professional aspects of teaching and school administrators, Vocational guidance
LB1805-2151	State teachers colleges
LB1811-1987	United States
LB1991-2151	Other regions or countries
LB2165-2278	Teacher training in universities and colleges
LB2300-2430	Higher education
LB2326.4-2330	Institutions of higher education
LB2331.7-2335.8	Teaching personnel
LB2335.86-2335.885	Trade unions
LB2335.95-2337	Endowments, trusts, etc.
LB2337.2-2340.8	Student financial aid
LB2341-2341.95	Supervision and administration. Business management
LB2351-2359	Admissions and entrance requirements
LB2361-236	Curriculum
LB2366-2367.75	College examinations
LB2371-2372	Graduate education
LB2381-2391	Academic degrees
LB2799-2799.3	Educational consultants and consulting
LB2801-3095	School administration and organization
LB2831.6-2831.99	Administrative personnel
LB2832-2844.1	Teaching personnel
LB2844.52-2844.63	Trade unions
LB3011-3095	School management and discipline
LB3045-3048	Textbooks
LB3050-3060.87	Educational tests, measurements, evaluations and examinations

School architecture and equipment. School physical facilities. Campus planning

LB3401-3495	School hygiene. School health services
LB3497-3499	Hygiene in universities and colleges
LB3525-3575	Special days
LB3602-3640	School life. Student manners and customs

Subclass RD Surgery

RD1-811	Surgery

RD1-31.7	General works
RD32-33.9	Operative surgery. The technique of surgical operations
RD49-52	Surgical therapeutics. Preoperative and postoperative care
RD57	Surgical pathology
RD58	Reparative processes after operations (Physiological)
RD59	Surgical shock. Traumatic shock
RD63-76	Operating rooms and theatres. Instruments, apparatus, and appliances
RD78.3-87.3	Anaesthesiology
RD91-91.5	Asepsis and antisepsis. Sterilization (Operative)
RD92-97.8	Emergency surgery. Wounds and injuries
RD98-98.4	Surgical complications
RD99-99.35	Surgical nursing
RD101-104	Fractures (General)
RD118-120.5	Plastic surgery. Reparative surgery
RD120.6-129.8	Transplantation of organs, tissues, etc.
RD130	Prosthesis. Artificial organs
RD137-145	Surgery in childhood, adolescence, pregnancy, old age
RD151-498	Military and naval surgery
RD520-599.5	Surgery by region, system, or organ
RD651-678	Neoplasms. Tumours. Oncology
RD680-688	Diseases of the locomotor system (Surgical treatment)
RD701-811	Orthopaedic surgery
RD792-811	Physical rehabilitation

3.2.2 Schedules

There are 41 LCC schedules for main classes and subclasses. The schedule is made up of preface, content page, outline, tables and index.

3.2.3 Notation

LCC notation stands for the book as a whole. The scheme uses mixed notation that is it uses both letters of alphabet and numbers. A single letter to form the main class, two letters forms the subclass and the numbers like 1-999 to form a subject. It also uses decimals for expansion. For example,

Main classes are denoted by single alphabet:
R – Medicine (General)
Two letters combination for sub-divisions:

RA – Public aspects of medicine
RB – Pathology
RC – Internal medicine
RD – Surgery
These are further subdivided by numbers used as basic;
RD – Surgery
58 – Reparative processes after operations (Physiological)
It is important to note that decimal numbers are used only in a situation when the whole number is not available. Decimals also serve as further subdivisions.

3.2.4   Index

The LCC scheme has no general index. Each schedule has its index and it's relative to the concerned class. However, two indexes were published in 1974 by the Canadian Library Association and the US Historical Documents Institute. It is also worthy to note that the web or online version of the LCC has indexed for the entire scheme.

3.2.5   Mnemonics

The LCC scheme does not have mnemonic aids. Some double letters have been used to denote the name of subject areas. For example, in class A, AE denote encyclopaedia, AP denote periodical, and AY denotes yearbook. In class M, M means music, ML signifies literature on music and in-class T, T signifies technology.

3.2.6 Revision

Each class of the LCC scheme is revised when needed and the changes made during the revision are published as soon as they occur in the LCC additions and changes published quarterly. However, with the web or online LCC, updates or revisions are done online and are made freely available.

3.2.8   Cutter Numbers

Cutter numbers are numerals that are used to differentiate one title of a book from the others. It differentiates books with common classification elements from each other. Cutter numbers are used for filing, cataloguing and arrangement of books on library shelves. Charles Ammi Cutter developed a table of prearranged numbers used by LCC to create symbols for authors, titles, subjects, countries, states, cities etc. The numbers range from 1-9 which represent an alphabet.

Figure 3. Charles Ammi Cutter
Source:https://forbeslibrary.org/research/cutter-classification/

During cataloguing and classification of materials, the need for using cutter numbers may arise, in this case, the name of the author, title of book, subject, country state, city etc. are spelt out in numerals instead of an alphabet. The process of using cutter numbers is known as *cuttering*. For example, to cutter a name, the first alphabet of the author's surname must be written and other letters will be represented by numbers. In practice, cutter numbers are for the first three letters of the authors (surname) name, subject, state, title and country. For example, the cutter number for Nigeria is.N55.

The National Open University of Nigeria Library uses the LCC scheme and as such, the university library has its own in-house cutter number table as can be seen below;

Figure 4. National Open University of Nigeria Library in-house Cutter table

For example, a book titled: Library classification: Theory and Practice, written by Pushpa, Dhyani with call number Z 696. D48 1998 will be interpreted as;

Z -Library Science Broad subject area (Library Science)
     696 -Narrows the subject area
     .D49– Cutter number for author's name (Dhyani)
     1998 – Year the book was published

You may be wondering how we arrived at (.D49) for author' name. The author's surname is Dhyani, to cut this name, let us use the NOUN cutter table above.

First of all, take the first letter of the author's name which is letter D and start with a dot (.), then you put down .D, D is consonant, therefore you move to item number 4 on the table that says "after other initial consonants for the 2nd letter".

The second letter after D on the author's name is letter h and h on the table is 4 (because it falls under 4 that denote letter e, from e, f, g, h before the letter i which denote 5). To get the second cutter number for the third letter of the author's name, you will move to item 5 on the cutter table that says "When an additional letter is preferred for the 3rd letter". The third letter of the author's name is y and y on the table is 9 (because it falls under 9 which denote letter x-z. in between x-z, we have y). Therefore, we arrived at (.D49) for the author's name.

3.3   Advantages of LCC Scheme

The following are some advantages of Library of Congress Classification Scheme;

1. LCC is extremely enumerative because it lists all subjects and also made provisions for the future by leaving out I, O,W, X and Y. It also repeats all subdivisions countless times even in the same class.
2. Library of Congress classification scheme is suitable for libraries with large collections because it can cope with vast knowledge areas and it enables exclusive class numbers for a wide range of subjects.
3. The Library of Congress classification schedules is revised regularly by subject professionals in their various fields.

4.   The notation is relatively short or brief compare to other schemes like the Dewey Decimal Classification scheme which have a longer notation.
5.   The LCC scheme is very detailed and comprehensive due to its unique structure. It is even useful to libraries that specialise in specific subjects.
6.   The scheme is kept up-to-date through additions and changes which is published quarterly and these changes are added in a new edition. However, with the web classification, updates are done regularly and made available online for professionals and users to access.
7.   The LCC already classified call numbers and made them available on Online Computer Library Centre (OCLC) through worldcat.org for cataloguers and classifiers to copy. It has made cataloguing and classification easy and simplified for professionals.
8.   LCC scheme makes use of cutter numbers and decimal expansion when classifying materials making each book have its unique call number.

3.4   Disadvantage of the LCC Scheme

The following are some disadvantages of Library of Congress Classification Scheme;

1.   LCC scheme lack instructional manual, that is it does not provide a guide on how to use the schedules thereby making it difficult for users.
2.   The notation is not expandable and as such new subjects are accommodated by gaps or numbers left unused.
3.   LCC does not have a general index in print format, thereby leading to a large number of schedules. However, web classification has a combined index.
4.   LCC schedules are very expensive to acquire both the print and web version.
5.   Books on African subjects are not sufficiently covered.

4.0   CONCLUSION

The LCC scheme is one of the largest schemes because of its ability to cover large subject areas. The scheme is widely used by libraries all over the world because it aids in shelf classification and location of subject for easy access and retrieval. The scheme is continuously revised in print format, however, with web classification; the scheme is updated regularly and made freely available online.

5.0 SUMMARY

In this unit, we have discussed extensively on the LCC scheme. We gave a brief history of how the scheme was developed. Remember the scheme first adopted Thomas Jefferson system of classification and with time, two librarians (J. C. M Hanson and Charles Martel) invented the Library of Congress Classification scheme after Herbert Putman had worked on some parts. The scheme is widely used by libraries over the world because it covers wide subject areas. It is made up of 21 main classes which are subdivided into other subject areas. It uses mixed notation, which means that it uses alphabet, numerals and decimals. Do not forget, we discuss cutter number and the inventor of the cutter number is Charles Ammi Cutter. We also discussed the advantages and pitfalls of the LCC scheme.

6.0 TUTOR-MARKED ASSIGNMENT

1. Discuss Library of Congress Classification scheme.
2. List 21 main classes of Library of Congress Classification scheme.
3. Discuss four features of Library of Congress Classification scheme.
4. List five advantages of Library of Congress Classification scheme.
5. List four disadvantages of Library of Congress Classification scheme.
6. What is a cutter number?

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MODULE 4   KNOWLEDGE ORGANISATION

Module 4, discusses techniques for information and knowledge organisation, a universe of knowledge structure and architecture, modes of subject formation; index formation, notation and construction of classification numbers.

Unit 1   Techniques, Universe of Knowledge Organisation, Structure and Architecture
Unit 2   Modes of Subject Heading and Indexes Formation
Unit 3   Notation and Construction of Classification Numbers

UNIT 1   TECHNIQUES, UNIVERSE OF KNOWLEDGE ORGANISATION, STRUCTURE AND ARCHITECTURE

CONTENTS

1.0   Introduction
2.0   Objectives
3.0   Main Content
      3.1   Concept of Universe of Knowledge Structure
      3.2.   Structure of Subjects
      3.3   Need for Classification of Library Materials
      3.4   Universe of Knowledge as Mapped in DDC, UDC and LCC Scheme
4.0   Conclusion
5.0   Summary
6.0   Tutor-Marked Assignment
7.0   References/Further Reading

1.0   INTRODUCTION

In this unit, we will discuss the universe of knowledge, modes of formation of the subject, a universe of knowledge structure, the need for classification of library materials, and the universe of knowledge as mapped in DDC, UDC and LCC schemes.

2.0   OBJECTIVES

By the end of this unit, you will be able to:

- concept, purpose of information and knowledge organization
- techniques of knowledge organisation

- define the universe of knowledge
- characteristics of universe of knowledge
- list and discuss the structure of subjects
- explain the architecture of subjects.
- discuss universe of knowledge as mapped in DDC, UDC and LCC scheme.

3.0   MAIN CONTENT

3.1   Concept, Purpose of Information and Knowledge Organisation

Information is referred to as meaningful messages, ideas recorded in conventional or non- conventional media processed, stored by systems and service to provide a more or less permanent memory of the message and their discussions with users (*Knowledge Organisation, Information systems and essay,20*06). Also, information can be defined as a processed data which is interpreted to convey meaning to the receiver of such processed data. The concept of data is referred to as 'raw' data – a collection of text, numbers and symbols with no meaning. When data is processed to provide meaning based on the context. Data on its own has no meaning. It only takes on meaning and becomes information when it is interpreted (Cambridge International Examinations. 2015). Qiao (2011), refers to information as the collection of three attributes: things themselves which included cause or effect formed in the process of interaction, the attributes of things that someone thinks and simulates, and the attributes of tools used when one considers, expresses, or simulates something. Among these types of attributes, stated some are true to the facts and some are incomplete, while others are not true. Robin in Ortega (2013: 164) defined the concept **information** in the field of library science "as the (addition of data, organization or classification with meaning, which in turn implies some type of processing or comprehension". According to Qiao (2011: 345) information can be "both material and mental, existing or conscious, produced or received, true or false, real or fictitious, right or wrong, remembered or forgotten, known or unknown; it can exist objectively but cannot be perceived subjectively, or vice versa; and it can be powerful or weak, have tangible or intangible value, and so on".

Knowledge is increased through the combination of information sources (Ortega, 2013). **Knowledge** is produced as a result of understanding information which was passed to us and using that information to gain knowledge of how to solve problems. Knowledge is acquired by a person as in form of information such as facts, and the understanding of information will help such a person to use the acquired information (knowledge) in knowing how to solve problems. Knowledge is divided

into two namely tacit knowledge and explicit knowledge. Tacit knowledge is the type of knowledge which is difficult to pass on to someone else, such as knowing how to do something that is individual skills. Explicit knowledge is Knowledge, such as facts that can be easily passed on to others without training. Knowledge is power and that knowledge is developed from an understanding of information; information is realised from attaching or assigning meaning to the interpreted data (Ortega 2013).

The term **knowledge organisation** emanated from the field of Library and Information science around 1900. Richardson established the field of Knowledge organization as an academic field around 1900 (Hjorland, 2008) then followed by Henry Bliss book titled *Organization of knowledge and system of the science*" where he stressed that book classification should be based on knowledge organisation.

Knowledge organisation can be defined as the totality of activities of describing documents, classifying, cataloguing, indexing and arrangement of knowledge sources such books, audio-visual resources, databases, archival materials and other information sources. According to Pontes and Lima in Chandly (2016) knowledge organisation is based on the consideration of different theories and their foundations. Hjorland (2008) sees knowledge organisation as the description of documents, contents, features and the arrangements of these descriptions to make the documents accessible to users seeking them. Knowledge organisation is carried out by specialists such as subject specialists, librarians and information specialists. According to Hjorland (2008), the act of organising this knowledge requires training of information professionals and Librarians in the field of library and information science programme. These programs or courses are in the areas of classification, cataloguing, bibliographic organization, indexing, abstracting, controlled vocabularies and subject analysis.

Purpose of Knowledge Organisation
Knowledge organization is the system that covers the application of classification schemes, knowledge maps, subject headings, semantic networks and term listing. The purposes of these activities of knowledge organization are

❖   To guide the users of the information on how to discover and browse and direct searching through the use of themes on a webpage or search engine sites.
❖   To enable organisers of the collection to answer questions concerning the scope of coverage of their collections.

❖   To organise information materials for easy access, retrieval and the management of the collection for easy identification by interested users.

Knowledge mapping is the visual aid use in locating where knowledge is within an organization or establishment. It directs you on where to find expertise when you need their knowledge. The knowledge map directs you to documents as well as to people and databases. Simply put knowledge map helps you to locate people within an organization who have expert skills in a given field.

3.2   Techniques of Information and Knowledge Organisation

Knowledge organization since the 1950s was based on certain assumptions and the use of common sense by a subject specialist who applied then Knowledge organisation. Broughton, Hansson, Hjorland and Lopez-Huets in Hjorland (2008) suggested that knowledge organisation used to be carried out using the various approaches or techniques such as

1.   Traditional approaches using classification systems (DDC, LCC and   UDC).
2.   The facet- analytical approach by S.R.Ranganathan about 1933.
3.   The information retrieval traditional (IR) founded in the 1950s.
4.   Use of oriented and Cognitive views in the 1970s.
5.   Bibliometric approaches (Garfield Science citation index in1963).
6.   The domain analytic approach 1994.

3.2.1 Traditional Approaches Using Classification Systems (DDC, LCC and UDC)

The traditional approach is based on human knowledge, assumptions not guided by laws or theories. The classification systems in place were based on practical experiences and individual thoughts which were not subjected to any empirical investigation. These assumptions and thoughts expressed in the classification schemes were used in the organization of knowledge in several libraries to ensure centralization of classification and indexing. According to Gaddis (2018) classification systems used in libraries and database during the traditional approach, eras are the Dewey Decimal Classification (DDC), Library of Congress Classification (LCC) and Universal Decimal Classification (UDC) this was as far back as 1876.

The traditional approach to knowledge organization is based on

a)   Use of principle of controlled vocabulary. This avoided the use of synonyms and homonyms as an indexing term to ensure standardized vocabulary.

b)   The use of Cutter's rule which emphasised that most specific, most appropriate expression vocabulary should be preferred in classification.

c)   Application of Hulme's principle of the literary warrant as to the basis of book classification. The literary warrant of Hulme states that a class heading is warranted only when literature in a book is shown to exist and test of the validity of a heading is the degree of accuracy with which it describes the area of the subject-matter common to the class (Hulme, 1911:447). Hulme advocated that thesauri, taxonomies, lists used in knowledge organization system (KOS) must be terms of a classification system.

d)   Knowledge organization should be based on the principle of arrangement from the general subject to specific subjects.

3.2.2 The Facet- Analytical Approach by S.R.Ranganathan About 1933

The idea of facet-analytical in classification was propounded by S. R. Ranganathan in 1933 and the British Classification Research Group. The faceted systems do not list all classes for classification but it provides building block from which specific class can be formed from an existing document. Ranganathan believes that new knowledge is formed based on the combination of pre-existing knowledge so new knowledge is expected in faceted systems, unlike enumerative systems. This approach is based on logical principles and not on theories but it has helped in the organisation of knowledge. This is because it is aimed at breaking down each subject into basic concepts (analysis). So, it uses relevant units and concepts in describing the subject matter of any information package. Subjects are analysed into facets using the proposed formula advocated by Ranganathan which **PMEST**. The full meaning of the abbreviation is
P – Personality (characteristic of a subject)
M – Matter (Physical material of which a subject is made off)
E – Energy (Action with regards to the subject)
S – Space (Geographical component of the location of the subject)
T – Time (Period connected to the subject)

3.2.3 The Information Retrieval Traditional (IR) Founded In the 1950s

The information retrieval approach is a technique used to ensure that users find relevant information from a vast collection. The information

retrieval is based on what to present for the users and the system to be put in place to help users match their request with the document from a collection. The problem IR solves is to help users identify relevant documents and the way of recalling the relevant document from the organised collection.

3.2.4 Use of Oriented and Cognitive Views in the 1970s

The activities of knowledge organisation should be merely based on satisfying the information needs of the users. The satisfaction of the user's information needs will be effectively achieved from empirical studies of the users. The empirical studies are carried out through collecting information from users or about users. Because of this Hyorland (2008), said that "systems based upon user-oriented approaches must specify how the design of a system is made based on empirical studies of users". This implies that in the organisation of knowledge emphasis should be based on the preferred users' verbal search system no on the classification notation.

3.2.5 Bibliometric Approaches (Garfield Science Citation Index) in1963

Knowledge organization using Bibliometric approaches means the use of bibliographic references in the organisation of a network of papers. These approaches are used in the development of Bibliometric maps. The Bibliometric maps are developed from co-citation analysis, bibliographic coupling or direct citation use for information retrieval.

3.2.6 The Domain Analytic Approach in 1994

The domain analytic approaches advocated that for one to choose a term or terminology to be used in knowledge organisation such a person must have had prior understanding of the field. To master a field, you must understand the concepts peculiar to that field of study. This approach solves the dilemma associated with the use of initial guess to generate a sequence of improving approximate solutions for a class of problem (solves the problems of using iterative methods) in knowledge organisation.

3.3 Concept of Universe of Knowledge

Knowledge refers to information, facts, figures, and skills people acquire through education and experience. It could also be referred to as the extent to which an individual understands or comprehend a subject. Oxford English dictionary defined knowledge as the acquaintance with a branch of learning, a language, or the theoretical or practical

understanding of an art-science or industry. There are two types of knowledge;

a) **Personal Knowledge**: These are knowledge created or held by individuals. It is held by the individual's mind and they can share this knowledge by interacting with other people. It is more or less referred to tacit knowledge which is knowledge held by individuals within an organisation.

b) **Social Knowledge**: These are knowledge collectively created or produced a group of people within a community. It is knowledge created by groups such as family, social group or society and it involves sharing and contributing to knowledge by people within a community. This knowledge can be available to people through libraries whose responsibility is to organise and preserve knowledge in various format.

3.4   Characteristics of Universe of Knowledge

Characteristics of the Universe of knowledge are the total of past, present and future knowledge. The universe of knowledge has many characteristics and they are;

•   Knowledge is infinite due to the continuous creation of knowledge from the past to the present and anticipated future. Therefore, there is a need for time and space for the expansion and future addition of knowledge.
•   A universe of knowledge is in continuum because knowledge creation is continuous.
•   A universe of knowledge is dynamic because new thoughts and ideas are created continuously by organised research.
•   A universe of knowledge is cumulative because knowledge grows regularly and therefore this knowledge is added to existing or already created knowledge.
•   A universe of knowledge is coherent.
•   It is multidimensional.
•   It is multidirectional because of the growth in knowledge from different subject areas and hence the needs for classification of library materials.

Knowledge is represented in form of a subject so that it captures the terms, nature, concepts, components, characteristics, and relationships. This is an indication that every subject has its structure or architecture. Hence, for you to be sure of knowing a subject, you must understand the concepts, components, patterns, relationships, ideas and structure of that subject. At this point, you may ask what a subject is. What are the modes of formation of the subject?
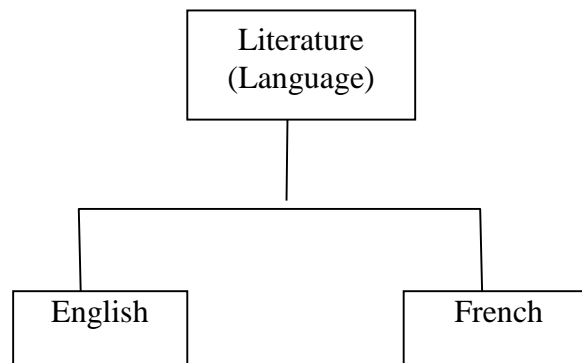
3.5　Structure of Subjects

The modes of formation of a subject which are fission, fusion, lamination, loose assemblage, distillation and agglomeration affect the structure of subjects. The following are the structure of subjects;
1.　　Dichotomy or Superimposed Subjects
2.　　Decachotomy
3.　　Polychotomy
4.　　Proliferation

3.5.1 Dichotomy or Superimposed Subjects

This is also called *Binary Classification* or *Tree of Porphyry*. It is a division of the subject into two. In dichotomy, the first stage involves two divisions, in the second stage, two subdivisions of each division are obtained and the process of division may be continued. These subjects consist of two or more simple subjects from subdivisions of the same main subject. Example

```
              ┌─────────────┐
              │ Literature  │
              │ (Language)  │
              └─────────────┘
                     │
        ┌────────────┴────────────┐
   ┌─────────┐               ┌─────────┐
   │ English │               │ French  │
   └─────────┘               └─────────┘
```

3.5.2　Decachotomy

This refers to a division into ten. Dewey Decimal Classification (DDC) is an example of dichotomy because it divided the whole universe of knowledge into 10 main classes of which the tenth class was devoted to general document not belonging to any of the main classes.

3.5.3　Polychotomy

This means the division into many parts, branches or classes. In polychotomy, the number of divisions is 24. However, due to the increase rate of the universe of a subject, 24 divisions were found to be too restrictive. Hence, the number of divisions to be incorporated at each stage was not fixed. For example, main class Literature is divided into two forms namely by form (Poetry, Fiction and Drama) and Language (French, English etc.) each are further divided into subdivisions.

3.5.4 Proliferation

The universe of the subject can be proliferated or spread in different ways. For example, a complex subject may be formed by attaching some other basic subject as a phase and a compound subject may be formed by attaching one or more isolate ideas to the basic subject and through these various ways, the isolate ideas can be proliferated. An example is the phase relationship is the interaction of one main class with another *"Influence of Islam on English Literature". This represents two main classes "***Religion** and **Literatur**e.

The universe of knowledge and its structure are important to librarians or information professionals because without understanding these concepts, it will be difficult to organise and arrange information materials for easy access and retrieval by users. Therefore, at this point, you may ask the need for classification of information materials.

3.6   Architecture of Subject

There is a lot of relation and inter-relations that exist between subjects and their components in the subject building. Subject according to Ranganathan (1967, p. 82), "is an organised or systematic body of ideas whose extension and intention are likely to fall coherently within the field of interest and comfortably within the intellectual competence and field of inevitable specialization of a normal person". Ranganathan also explained that architecture or building of a subject can be basic, compound or complex. Subject contains ideas such as basic ideas, isolate ideas, and speciator ideas.

1.   **Isolate Idea**: This is an idea that is not enough to form or be a subject by it but rather isolate form components of a subject.
2.   **Basic Subject Idea**: This is a subject without any isolate idea as a component. For example, the basic subject includes Biology, Physics, Philosophy, Mathematics, within the main class of sciences etc.
3.   **Speciator Idea**: It is called a modifier because when combined with a basic subject idea, or an isolated idea, it produces a change in their meanings. It can also be called a derived subject example is Geophysics derived from geology and physics.
4.   **Compound Subject**: This is a combination of a basic subject idea with one or more speciator ideas. Examples of a compound subject are, Fundamental of Mathematics, Psychology of teachers, forms of chemical combination etc.
5.   **Complex Subject**: This is a subject that contains two or more basic subjects. It can also be said to contain mostly inter-

disciplinary relations of a subject. Examples of complex subjects are; Physics and Chemistry, Philosophy and Religion etc.

6. **Macro subject:** This is a subject of great extension and small intentions usually embodied in a whole book single volume or multi-volume.

7. **Micro subject**: A subject of small extension and great intentions usually embodied in an article in periodical or part of a book.

3.7 Universe of Knowledge as Mapped in DDC, UDC and LCC Scheme

We have discussed different types of classification schemes in module 3. However, we are going to discuss 3 popularly used schemes. At this point, we will discuss how the universe of knowledge is mapped or represented in some general library classification systems such as

1. Dewey Decimal Classification (DDC)
2. Universal Decimal Classification (UDC)
3. Library of Congress Classification (LCC).

3.7.1 Dewey Decimal Classification (DDC)

This is a classification scheme whose structure is based on the Baconian system of classification. It is a hierarchical scheme that starts from the general to specific. In DDC, the whole universe of knowledge is divided into 10 main classes in the first summary. These 10 main classes are further divided into a hundred divisions in the second summary of DDC. A hundred divisions are further divided into thousand sections found in the third DDC summary. The main classes represent disciplines which are divided into subdivisions and further divided into various subjects. It is a scheme that uses pure notation. It uses only numbers in its notation.

3.7.2 Universal Decimal Classification (UDC)

This classification scheme is based on the structure of DDC which is made up of 10 main classes from 0-9 with class 4 which was formerly *Linguistics* merged with class 8. It was vacant to accommodate future subject. It is an analytico-synthetic scheme that contains auxiliary tables, notational system and symbols. The UDC scheme uses mixed notation which consists of numbers and alphabetical letters. The UDC schedules contain various disciplines and branches of knowledge are properly arranged in the main classes.

3.7.3 Library of Congress Classification (LCC)

This is an enumerative classification scheme whose structure is based on Cutter's Expansive Classification system in broad divisions. It is a classification that was based on a literary warrant. LC classification is an enumerative scheme that uses 21 letters of the 26 letters of alphabets to represent classes and subject areas. I, O, W, X and Y letters are not yet in use but are kept to accommodate future subjects' additions. Capital letters are used to denote main or broad classes, while subdivisions use two capital letters. Further subdivisions or subtopics are denoted by decimals for expansion while cutter numbers are used for author, title, subject, and country. Hence, the LC scheme uses mixed notation because it uses both letters and numbers. The LC scheme has no general index. Each schedule has its index and it's relative to the concerned class. A single letter to form the main class, two letters forms the subclass and the numbers like 1-999 to form a subject.

4.0 CONCLUSION

The universe of knowledge is indeed the totality of knowledge from the past, present and anticipated future. Knowledge is created or generated regularly; new knowledge is added to existing ones. This knowledge must be organised in form of a subject. Hence, there is need for classification of knowledge in an orderly manner. This technique helps information professionals or librarians to adopt a scheme that will enable the arrangement of information resources according to their subject areas for easy accessibility and retrieval by users.

5.0 SUMMARY

We have discussed what universe of knowledge is and its characteristics. In the process of discussing the universe of knowledge, we defined knowledge as information, facts, figures, and skills people acquire through education and experience. A universe of knowledge is the total of past, present and future knowledge. A universe of knowledge has many characteristics and they are, infinite, continuum, continuous, multidirectional, multidimensional and dynamic. We also discussed the modes of formation of the subject; in the process of discussing modes of formation of the subject, we discuss what subject is, types of the subject include basic, compound and complex subject. Types of modes of formation of the subject include loose assemblage, lamination, fission, fusion, distillation, agglomeration and cluster.

The modes of formation of the subject also affect the structure of subjects. The following are the structure of subjects, dichotomy, dichotomy, polychotomy and proliferation. The need for classification

was discussed and how the universe of knowledge is represented in UDC, DDC and LCC schemes.

6.0   TUTOR-MARKED ASSIGNMENT

1.   Define and explain the term Organization of Knowledge.
2.   Explain three techniques of Knowledge Organisation.
3.   Define the universe of knowledge.
4.   Discuss some characteristics of the universe of knowledge.
5.   Define the term Subject.
6.   List and explain the different types of subject.

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UNIT 2   MODES OF SUBJECT HEADING AND INDEXES FORMATION

CONTENTS

1.0   INTRODUCTION

In your last unit you studied about knowledge organiation. How knowledge is being organised and the purpose of organisation knowledge to help achieve the five laws of library science and the basic laws guiding organisation of knowledge. Then what differentiates each subject in the organisation are their characteristics which chosen in their subject heading each subject bears. This will introduce you to the lesson of today "Modes of Subject Heading and Indexes Formation"

2.0   OBJECTIVES

By the end of this unit you should be able to:

- define the concepts of subject heading
- explain the modes of subject heading formation
- discuss the concept of indexes
- state and explain the modes indexes formation.

3.0   MAIN CONTENT

3.1   Concept of Subject Heading

The subject heading is the list of preferred subject access terms or controlled vocabulary that are assigned to a thought – the content of a document as an access point in a bibliographic collection, such as library catalogue database. The subject heading helps a user of the library catalogue to search and retrieve a document or information by subject

from the library catalogue or computer database. The use of controlled vocabulary (Library of Congress Subject headings and Sears List of subject headings) for subject headings identifies the terms that are exactly or nearly the same in meaning and selects the one that is mostly preferred term among them and use it as a subject heading.

So the subject heading is the term used in describing a subject, providing search address or access point for easy retrieval of such document using its subject address or identity. For example, "Coronavirus 2019 in Nigeria" can be described using the following terms;
Coronavirus 2019,
COVID -19, War
War on Coronavirus 2019, Nigeria
COVD-19 Pandemic Nigeria Experience

Using a controlled vocabulary all the document about Coronavirus in Nigeria can be placed under on subject heading such as;
Coronavirus – History – Nigeria 2019

Simply put that a subject heading is a word or phrase which is used in describing the thought - the content of a document or any information material. The subject headings are formed or developed by classificationists, classifiers, information specialist and documentalist. In developing the subject headings, the relationships that exist between subjects and their components are identified. These identified relationships among subjects and their components have helped in the designing of classification schemes.
The following are a list of tools use in assigning subject heading to documents in classification;

1.   Library of Congress list of Subject Headings (LCSH) – 1897
2.   American Library Association List of Subject Heading (ALSH) 1895
3.   Sears List of Subject Headings (SLSH) 1923
4.   Medical Subject Headings (MeSH) –1954

3.2   Mode of Subject Formation

The classificationists, documentalist and the classifiers are responsible for the formation of subject headings. These subject headings are derived from the thought – content ideas of a document. When the thought – content ideas are organised it forms a subject.

The mode of subject formation in the universe of subjects as propounded by Ranganathan and his thoughts in 1950 is based on four modes. The four modes were;

- Loose assemblage
- Lamination
- Dissection
- Denudation

These modes of subject formation are developed to help in the development of subject headings used in designing schemes of classifications. Other modes of subject formation as enumerated by Gopinath and Seetharama (1979) are

1. Loose Assemblage
2. Lamination
3. Fission
4. Fusion
5. Distillation
6. Agglomeration
7. Cluster

3.2.1 Loose Assemblage

The Loose Assemblage as a mode of subject formation is divided into three-phase relation namely
1.   Inter- Subject Phase Relation
2.   Intra – Facet Phase Relation (Intra – Schedule Phase Relation)
3.   Intra – Array Phase Relation

These phases of relation are classified under the following six modes of formation;
- General relation
- Bias
- Comparison
- Difference
- Influences
- Tool (when a subject used as a tool for the study of other subjects)

3.2.1.1   Inter – Subject Phase Relation

Intersubject phase relation is a type of loose assemblage is described as when two or more subjects occur between subjects which are studied in

their mutual relation (i.e. each subject benefit from one another). This relation is called inter-subject phase relation. For example

- General relation – the relation of mathematics to chemistry
- Bias – Home Economics biased to Chemistry
- Comparison – Physics compared with Chemistry
- The difference - Difference between Home Economics and Chemistry
- Influences - Influence of Chemistry on Home Economics
- Tool – The application of statistics to be the Library and Information   Science

3.2.1.2   Intra – Facet Phase Relation (Intra – Schedule Phase Relation)

The second phase of loose assemblage which occurs when two or more isolate from the same schedule are joined together into a mutual relation.

The relation helps to connect facets within basic subjects. Examples of phase relation under this loose assemblage 2 are

- General relation – relation between Christianity and Islam
- Bias – bias of Wole Soyinka to Shakespeare
- Comparison – comparison of Christianity and Islam
- The difference – the difference between Christianity and Islam
- Influences – Christianity influence by Hinduism
- Tool- Application of logic in the programming language

3.2.1.3 Intra – Array Phase Relation

The loose assemblage phase 3 relation states that two or more isolates derived from the same array of order higher than 1 in the same schedule are brought into mutual relation. This gives rise to complete isolate. Examples of the phase relation are
- General relation – relation between urban dwellers and rural dwellers
- Bias – bias of Dewey Decimal Classification towards Colon Classification
- Comparison – Urban dwellers compared with Rural dwellers
- The difference – the difference between Colon Classification and Dewey Decimal   Classification
- Influences – the influence of Colon Classification on Dewey Decimal   Classification
- Tool – application of Colon Classification on Dewey decimal classification.

Lamination
Lamination is of two kinds.
Lamination 1: It can also be two or more isolates from the same schedule of an isolate can be compounded to form compound isolates. That is one or more isolates facets are joined with the basic subject to give rise to a compound subject.
Example: History (basic subject)Nigeria(isolate)   Constitution (isolate)
Lamination 2: This is when "two or more species of the basic subject going with the same primary basic subjects are compounded over one another, giving rise to a compound subject" (Kumar 1979:205).
Example:

3.2.3 Fission

In this type of mode of subject formation, "a basic subject or an isolate is split into a subdivision. Subject specialist calls this process *fragmentation*.

The fission is of four kinds namely;
- Fission of basic subjects with other secondary basic subjects' example – Metaphysics, ethics and aesthetics.
- Fission of isolate ideas - Africa gives us array division such as Nigeria, Ghana, Ivory Coast and South Africa.
- Dissection: denote fission when considering the array of a division of an isolate or a basic subject resulting from fission**.**
- Denudation: a term which is used to denote fission when only on a subdivision of an isolate or a basic subject resulting from fission (Kumar1979: 206).

3.2.2 Fusion

In this mode of subject formation two or more primary basic subject are fused in a way that one loses its individuality to the schedule of isolates which is needed to form the compound subject that will go with it. This process will result in a formation of the new primary basic subject. Examples are

Biophysics – resulted from the fusion of biology and Physics
Biochemistry – resulted from the fusion of biology and Chemistry
Geo-Physics – resulting from the fusion of Geography and Physics
Educational Administration – New primary basic subject resulted from a fusion of Education and Administration.

3.2.3 Distillation

Distillation is one of the modes of subject formation is when a pure subject evolves as a primary basic subject from its appearance – in – action in diverse compound subject going with either different basic subject or the same basic subject. Examples are

- Management Science
- Microbiology, Research Methodology

3.2.4 Agglomeration

Agglomeration is "a process of the collecting together of entities into large masses without cohesion among the component" (Kumar, 1979). Also, it can be a basic subject or an isolated idea. Example: Geology and Geography.

3.2.5 Cluster

Here, several specialised studies or particular entities are joined together into a field of study. The cluster may be between interdisciplinary or multidisciplinary result. Examples
Soil Science (Soil its focus of the cluster)
Nipponology (Japanese Studies)

3.3   Concept of Indexes

Indexes are locators, pointers and indicator to an information source or information. The indexes are arranged in alphabetical order. The indexers help users of a user to locate or find out the needed information easier using the index (word or phrases provided as a subject heading). The information may be from a periodical, books, computers and other publications. An index is defined by Ekere and Mole (2014:104) as "an alphabetical list of subject terms used in a classification with their notational references". Indexing is the process of listing the entries (subject terms) and arranging the entries in alphabetical order for easy location of the document. The person who prepares the entries (indexes) is called the Indexer.

In indexes formation, the indexer analyses the document to bring forth the terms based on his understanding of what users may search for information under. This process is not done arbitrarily but requires that the indexer should be intelligent and knowledgeable in the field to be indexed.

3.4   Indexes Formation

Indexes formation can be done manually and can be computer base. The purpose of indexes formation is aimed at providing identification for storing information in a record of collection and providing a pointer or access point to the retrieval of the information or document. These activities of providing an access point and a pointer to the information are carried out by experts called indexer. These indexers follow certain laid out principles, guides and techniques practised and acquired through training in achieving such task. The followings are the techniques used in the formation of indexes;

1.   As an indexer, you should have general knowledge on the document to be indexed. This is done through reading through the title page, preface, foreword, table of content; publisher blurb and chapters of the document etc. All these readings and scanning are carried out just to determine the subject matter of the document to ensure that the appropriate term or phrase is used in describing the document.

2.   You as the indexer should now do the content analysis of the document to determine the concepts treated in the book or document. Then decide which concept or terminology that captured the content of the document. You can use the Library of Congress Subject Heading List (LCSH) and Sears's list of Subject Headings (SLSH) controlled indexing language to get the suggested term or concept. You as an indexer can develop your indexing language or use an imposed by the organization or institution you are serving or use the LCSH and SLSH in carrying out this function.

3.   You then translate the selected term or terminology to match the concepts or the term, phrases used in the indexing vocabulary of LCSH or SLSH. But where the indexer developed an in-house term or vocabulary as his indexing language without using the controlled vocabulary there will be no need for translation.

4.   Combine headings and sub-heading into related headings using a controlled vocabulary.

5.   Use cross-referencing to direct users seeking information from term not used to those that are being used. This is done through using cross-referencing of "See Also" and "See" in an index. The "See reference" refers you to from unused term to a used term or phrase in the index. Examples

Algebra   Reference Matter
                    "See"   **"See"**
Mathematic,   Endnotes, Bibliographies, indexes

While "See Also" refers you to other used terms that are related to the used one. The see also reference can be used when two different terms, expressions, names and concepts are used equally in describing an item or document, it important to refer the users to both terms. It may be a change of name of an institution, companies or country. Examples

           Diamond Bank   Library Science
           "See Also"   **"See Also"**
           Access Bank   Library and Information Science

6.   Arrange the index terminology used into alphabetic order for easy search and identification by the users.

In the formation of indexes can be carried using the computer this is called automated method. The automated method as defined by Tulic in Obaseki (2010) as the process of assigning and arrangement of index terms for a natural language without intervention. This type of index uses algorithms. The automated indexing method uses keywords such as
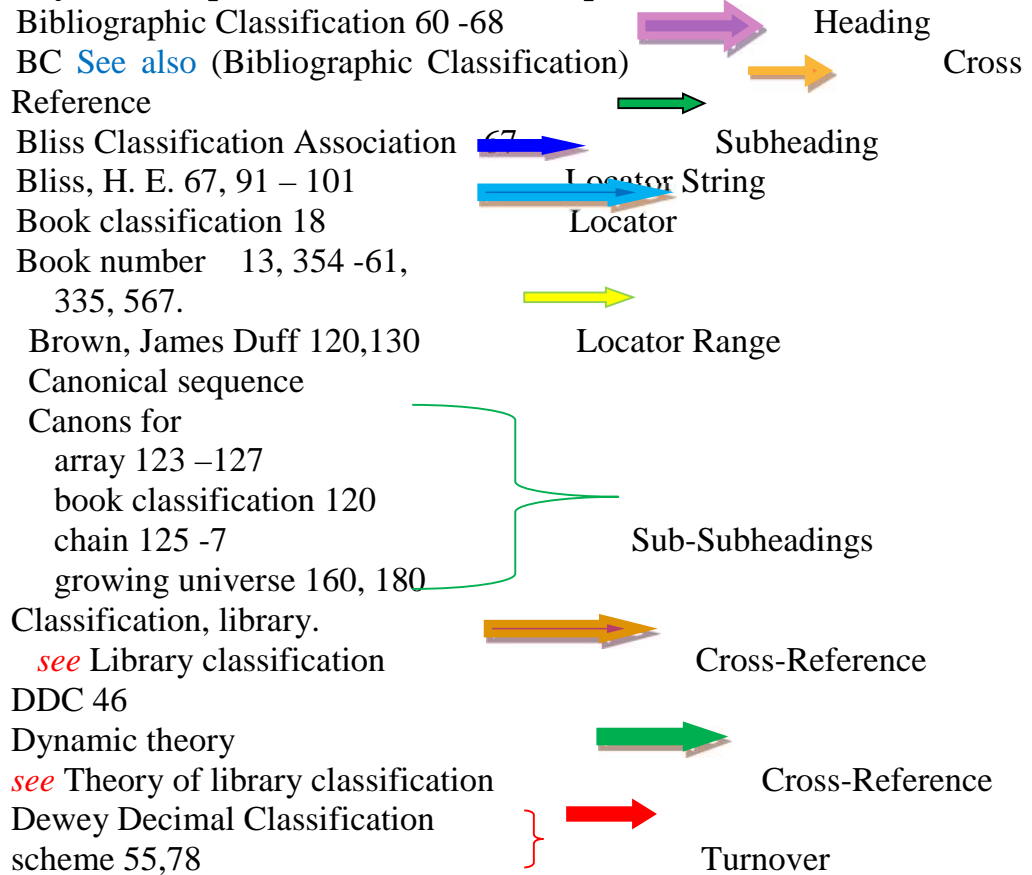
- KWIC (Key Word In Context)
- KWAC (Key Word At Context)
- KWOC (Key Word On Context)

Concepts in Index formation are as follows;

➢ **Term:** Which is any word, phrase or symbol uses to describe or represent a concept.
➢ **Heading:** A heading is a single top-level topic appearing in the index. Heading maybe referred to as "main heading or main entries".
➢ **Subheading:** It is the heading at the third level which is seldom used although indexing software support it up to the six-level of subheading.
➢ **Cross - Reference:** It is referred to as the "See Also" and "See"
➢ **Indent**: It is used for subheading and sub-subheadings. Also, it is used to present turnover. Turnovers are lines that are long to fit into the column width.
➢ **Locators**: Is the part of the index entry that directs any user to the page number, a figure number or URL where to find the material referred to. If the locator extends across two or more locators it is known as **locator range** but when several locators are attached to the same heading it is called **locator string**.
➢ **An Entry Blocks:** This refers to all the text under a single heading including the subheadings, locators and cross-references

For Example, building an index for a book titled *Theory of Classification* to show the use of above in **Concepts in Index formation.**

(Any word or phrase in the below example is called a Term)

Bibliographic Classification 60 -68   Heading

BC See also (Bibliographic Classification)   Cross Reference

Bliss Classification Association   67   Subheading

Bliss, H. E. 67, 91 – 101   Locator String

Book classification 18   Locator

Book number   13, 354 -61,
     335, 567.

Brown, James Duff 120,130   Locator Range

Canonical sequence

Canons for
    array 123 –127
    book classification 120
    chain 125 -7   Sub-Subheadings
    growing universe 160, 180

Classification, library.
   see Library classification   Cross-Reference

DDC 46

Dynamic theory

see Theory of library classification   Cross-Reference

Dewey Decimal Classification
scheme 55,78   Turnover

These automated methods are now replaced with the following methods

- ❖   Vector Space Model
- ❖   Rationalistic
- ❖   Pragmatic
- ❖   Classical IR
- ❖   Probabilistic
- ❖   Semantic Text and
- ❖   Neutral Network

4.0   CONCLUSION

To help users to satisfy their information needs the classificationists and information specialists developed tools and techniques to help in the development of the classification of subjects. The development of indexes is all geared toward directing users to the information they need. Also, to direct them to the terms they thought that the classifier used in the documentation and to the actual term used for easy retrieval of information. The subject heading and indexes formation are geared

toward organization knowledge into a helpful sequence in storage and display in the shelves and databases.

5.0 SUMMARY

In this unit, you have learnt the concepts of subject heading and the indexes, indexer and indexing. Also, you have learnt about the modes of subject heading and indexes formation. Then test your ability or level of your understanding of these concepts, formation of indexes and subject heading by attending to the following exercises.

6.0 TUTOR-MARKED ASSIGNMENT

Attend to the following questions:
1. Define the term Subject heading.
2. Define the concept of Indexes.
3. List four modes of subject formation.
4. Explain four modes of index formation.

7.0 REFERENCE/FURTHER READING

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UNIT 3   NOTATION AND CONSTRUCTION OF CLASSIFICATION NUMBERS

CONTENTS

1.0   Introduction
2.0   Objectives
3.0   Main Content
          3.1 Concept of Notation
          3.2 Types of Notation
          3.3 Construction of Call Number
4.0   Conclusion
5.0   Summary
6.0   Tutor-Marked Assignment
7.0   References/Further Reading

1.0   INTRODUCTION

In this unit, you will learn what notation is, characteristics of notation and types. You will also learn how to construct call numbers.

2.0   OBJECIVES

By the end of this unit, you will be able to:

•   define notation
•   itemise some characteristics of notation
•   discuss types of notation
•   understand how to construct a call number
•   outline the functions of call numbers.

3.0   MAIN CONTENT

3.1   Concept of Notation

The term notation has been defined by different renowned library scientist as cited in Dhyani (1998) and Kumar (1979);

Bliss defined notation as "a system of marks or symbols in some order, denoting terms of a member of a series of system or things. For classification, a notation serves to denote the classes and their order, without naming or defining them; but it is not as has erroneously been said, a shorthand writing of names".

Berwick Sayers defined book notation as "a series of signs or symbols standing for the names of terms and forming a convenient means of reference to the arrangement of our classification".

Ranganathan defined notation as "a system of ordinal numbers used to represent the classes in a scheme for classification".

In summary, notations are symbols that are used in a book classification to represent main classes, subdivisions and divisions. A notation is vital for the classification of library materials and different classification schemes have its different notational system. Notation helps in the mechanised arrangement of information resources or materials in sequential order on the library shelves. The process of providing notation is known as a notational system. The notation consists of the use of;

- Arabic numerals
- Roman letters, both small and caps
- Punctuation marks
- Mathematical symbols

It has some characteristics or qualities. At this point, we will discuss some of the characteristics of notation.

3.2   Characteristics of Notation

The following are the characteristics of notations;

3.2.1 Uniqueness

This means that a class number should represent one and only one meaning which is vital due to the occurrences of synonyms and homonyms which is destructive to a classificatory language.

3.2.2 Brevity

This depends on the length of the base of the notation of the classification scheme. The brevity of notation also indicates that the call number should be easy to read, write, and pronounce.

3.2.3 Simplicity

This means that notation should be easy to read, write, pronounce and should convey order and acceptable to users.

3.2.4 Hospitality

This means that notation or class number should have the quality to accommodate new subjects in their appropriate places within a classification scheme. Notation or call number should be able to keep pace with a constant increase of knowledge.

3.2.6 Block formation

This involves the division of long class numbers into convenient blocks or blocks of a digit.

3.2.6 Flexibility

The notation should be flexible enough to accommodate new subjects and place them in their appropriate classes.

3.2.7 Mnemonic

This serves as a memory aid. A good notation should possess mnemonic which is important to a classifier. It helps in the consistent usage of the same digit or figure for the same concept.

3.2.8 Universal Use

When information materials or resources in the library are classified and allocated class numbers, these class numbers or notations are unique and use permanently and universally.

3.3 Types of Notation

The following are the different types of notation;
1.   Pure Notation
2.   Mixed Notation
3.   Faceted Notation
4.   Non-Faceted Notation

3.3.1 Pure Notation

This is when a classification scheme uses only one kind of digits in its notational base. This could be either Arabic numerals or alphabetical letters such as Roman capital or small letters. Example of pure notation is;

Arabic numerals 0-9
Roman capitals A-Z

Roman Small letters A-Z
Dewey Decimal Classification scheme uses pure notational system such as 0-9 in dividing the universe of knowledge.

3.3.2   Mixed Notation

This is a type of notation that consists of two or more kind of species of digits such as Arabic symbols and Roman capitals or small and numerals 0-9. Example of a classification scheme that uses mixed notation is Library of Congress Classification scheme. LCC scheme classifies by the use of both alphabetical letters and Roman capitals; Arabic numerals or numbers.

3.3.3   Faceted Notation

This is a type of notation in which the digits used in the class number are separated into blocks by the assistance of connecting digits. According to Ranganathan, a faceted notation is the number forming a block in class number.

3.3.4 Non-Faceted Notation

This is also known as *unipartite* notation. It consists of linear, horizontal right-handed notation with all the digits written closely or segmented into blocks. Library of Congress classification scheme is an example of a scheme that uses non-faceted or block form of notation.

3.4   Construction of Call Numbers

The call number is a symbol or letter or number assigned to a book in the process of classifying library books or documents. Call numbers are assigned based on the content of a book and its physical features. It is a number that represents the position of a book in a library and it contains other information such as volume number, edition, copy number, location and year of publication. No two library materials or books have the same call number, rather call number helps bring all books of a particular subject in the same location irrespective of the number of times a book is retrieved for use from the shelves of the library. It gives each document or book in the library a unique number. The call number is created or designed by a classifier based on the following features of the book;

- The specific subject of a book
- The language, year of publication, volumes and editions which is referred to as book number.

- Types of collection such as textbook, and periodicals which is referred to as collection numbers.

Therefore, the combination of the class number, book number and collection number are called call number.

Class Number: The class number of a book is the subject of a book translated into an artificial language of ordinal numbers.

Book Number: The book number deals with the physical features of a book. It distinguishes a book from other books that are having the same class number. Some of the physical features of book number include the use of author's name called the cutter author marks. This author mark is limited to three letters of the author's surname. The year of publication of the book, editions, volume number etc. may also be included.

Collection Number: This is based on the mode of publication, size, and type that will assist the classifier and enable users to differentiate a book. When constructing a call number, the classifier does the following;

i.   Decide the specific subject of the book or document before translating or converting it into an artificial language. The specific subject of a book covers one of the branches of the universe of knowledge or one main subject or two or more main subjects.
ii.   The specific subject may cover just a simple subject that has only one main or basic subject, or cover one main subject and common isolates.
iii.   The specific subject could cover only subdivisions of the main subjects.
The classifier determines the specific subject of a book based on;

- The title of the book, for example, the textbook on Introduction to Economics.
- The content and introduction of the book as well as the author's note about the book.
- When the title is not clear enough, the classifier needs to go through the thought

Content of the book or get assistance from subject experts if it proves difficult to decipher the subject in which a book or document belongs.

Once the subject of a book is determined by the classifier, he/she then translates the subject of the book into an artificial language base on the type of library classification scheme that is used. After the class number

of the title of the book has been given, the classifier needs to also look out for the physical features of the book to differentiate the book from others on the same subject.

In most cases, the author mark is given using the cutter table. Although sometimes the author table is not enough to differentiate a book from others, hence the classifier goes further by checking the year of publication of the book, volumes, and editions. For example, in some libraries, when there are three copies of a book that has same author, title and year of publication; the classifier differentiates each book by including or indicating copy1, copy2, copy3 etc. at the end of the call number. This is to enable the library users and librarians know that there is more than one copy of a particular book. If the year of publication seems to be different, this can be used to differentiate books of the same author and title. Sometimes, a specific title of a book written by one and a same author can have up to 3 volumes, you can differentiate these books by adding the volumes at the end of the call number.

After adding book number to the call number, the classifier sometimes adds collection number to differentiate books or collection in the library by adding a symbol that is used to indicate specific collection. These symbols vary from libraries to libraries. For example, Reserve Collection can take a symbol like RC; Reading Room can take a symbol like RR. However, it is worthy to note that the class number is an essential part of the call number because sometimes, the book number is not included. The collection number is often required sometimes since they needed to be added to the library catalogue or on the library shelves. Another reason is that most of the classification schemes do not include collection number.

At this juncture, let us construct a call number using DDC and LCC. For example, let us first use DDC.

DDC assigns each book in the library a number based on its subject matter. It divides the universe of knowledge into 10 main classes, 100 divisions and 1000 sections thereby generating a three-digit number that can be expanded with an infinite number of decimal places to get more details about a book. For example,

839.3.O24 2019

Main Class	800	Literature
subdivision	830	German and Related Literature
Section	839	Other Germanic kinds of literature
	839.3	Dutch, Flemish, Afrikaans(Further narrowing of the subject)
	O24	Cutter number representing the author's surname
	2019	The year the book was published

Let us look at another example, a book titled: Universal primary education in Nigeria: Issues, prospects and problems / edited by N.A. Nwagwu and published in 1976 with call number: **372.9669**

Main Class	300	Social Sciences
subdivision	370	Education
Section	372	Elementary Education
	372.9669	Historical, geographic, person treatment of elementary education (Further narrowing of the title of a book)
		There is no Cutter number representing the author's surname because the book was edited
	1976	The year the book was published

At this juncture, let us construct a call number using Library of Congress Classification (LCC) scheme. LCC is made up of 21 classes represented by a single letter. These are divided into subclasses which are made up of two letters. The subclasses are allotted whole numbers which can be expanded into decimals to narrow the subject to a more specific subject area. This is followed by a cutter number and year of publication of the book; all these forms the call number. For example, a book titled: Universal primary education in Nigeria: Issues, prospects and problems / edited by N.A. Nwagwu and published in 1976 with call number LA 1631 .U55 1976.

Main Class	L	Education
Subclass	LA	History of Education
Topic Area	LA1631	LA410-2284 Other regions or countries
	.U55	This represents the cutter number for a title. The title is used because the book is edited and hence does not have the author.
	1976	The year the book was published

The LCC scheme writes the call number in block form as seen below;

```
LA
1631
.U55
1976
```

Let us look at another example, a book titled Library classification: Theory and principles written by Pushpa Dhyani, 1998 with call number **Z696.A4 D48 1998**

Main Class	Z	Bibliography. Library Science. Information Resources (General)
Topic Area	Z696	Z696-697Classification and Notation
	.A4	This represents the cutter number for a title.
	.D48	This represents cutter number for author's name
	1998	The year the book was published

```
Z
696
.A4
D48
1998
```

Let us look at an example, a book titled: Fundamentals of managerial economics / Mark Hirschey, James L. Pappas, 1998 with call number HD30.22 .H56 1998.

Main Class	H	Social Sciences
Subclass	HD	Industries. Land use. Labour
Topic Area	HD 30.22	HD28-70 Management. Industrial management
	.H56	This represents the cutter number for author'name
	1998	The year the book was published

```
HD
30.22
.H56
1998
```

3.4   Functions of Call Number

The following are the functions/purpose of call number;

1.   It helps in the fast and easy location of a book on the shelves of the library.
2.   After a book is retrieved from the library shelve for consultation by users, this book is returned after use with the call number, the book is easily replaced on the shelve for the next user.
3.   Libraries acquire books at intervals; when these books are acquired, they are organised and classified and place among other existing books dealing with the same subject.
4.   When a book is first acquired in a given subject, it is placed close to other existing books on related subjects.
5.   It helps ease the removal of unwanted books or documents from the library shelves.

4.0   CONCLUSION

A notation is important in the arrangement of library materials. The classification scheme adopted by a library will determine the type of notation to use, whether pure, facet and non-facet or mixed. Notation or call number is vital in classifying library materials according to the subject. Call numbers give all information materials in the library a unique number that differentiates one book from another. With call number, library users can easily identify and locate books on the shelves without assistance from librarians.

5.0   SUMMARY

In this unit, you have learnt about notation and how call numbers are constructed. Notations are symbols that are used in a book classification to represent main classes, subdivisions and divisions. The notation consists of the use of Arabic numerals; Roman letters both small and capitals, and punctuation marks. Some of the characteristics of notation include uniqueness, brevity, simplicity, hospitality, block formation, flexibility, mnemonics and universal use. There are different types of notation such as pure, facet, non-facet and mixed. We also discussed call numbers, and we defined call number as a combination of the class number, book number and collection number. We also described how call numbers are constructed. It is important that you study this unit very well and understand every bit of what is discussed.

6.0   TUTOR-MARKED ASSIGNMENT

1.   Define the term notation.
2.   List 5 characteristics of notation.
3.   Discuss the different types of notation.
4.   What is a call number?
5.   What is a book number?
6.   What is a collection number?

7.0   REFERENCES/ FURTHER READING

Dhyani, P. (1998*). Library Classification: Theory and Principles*. New Age International (P) Ltd., Publishers, India.

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MODULE 5   PRACTICUM ON LIBRARY CLASSIFICATION AND CURRENT TRENDS

Module 5 is comprised of two units which are centred on carrying out practical exercises on classifying physical books with the Library of Congress, Dewey Decimal Classification Schemes and formation of Subject indexes using these books. You are also encouraged to visit your centre library with your ID showing that you are a student of Library and Information Science from this University for the Centre Librarian to allow you use the hard copies of these to practice.

Unit 1   Practicum on Library of Congress, Dewey Decimal Classification Schemes and Subject indexes

UNIT 1   CURRENT TREND IN-LIBRARY CLASSIFICATION

CONTENT
1.0   Introduction
2.0   Objectives
3.0   Main content
        3.1   Practicum on Library of Congress Schemes
        3.2   Practicum on Dewey decimal classification Schemes
        3.3   Practicum on Subject Indexes
4.0   Conclusion
5.0   Summary
6.0   Self – Assessment Exercise
7.0   References/Further Reading

1.0   INTRODUCTION

In module 3 you have learnt about the various classification schemes, features and the uses of these classification schemes in the organisation of knowledge. The most used classification schemes in the classification of library resources are the Dewey Decimal Classification (DDC) and the Library of Congress Classification (LCC). I know you will be wondering how to classify a book using these schemes. In this unit, you learn how to classify a book using the two most used schemes DDC, LCC and how to assign subject index.

2.0   OBJECTIVES

By the end of this unit, you will be able to:

• understand and practice the steps involve in the classification of library resources (books) using dewey decimal classification (ddc) scheme.
• understand and practice the steps involve in the classification of library resources (books) using library of congress classification (lcc) scheme.
• understand and practice the steps involve in the assigning of subject index to a document.

3.0   MAIN CONTENT

3.1   Practicum on Dewey Decimal Classification Scheme

To classify a document or a book with DDC, you need to master the structure of the DDC **schedules**, **tables** and the **relative index**. Understand that DDC uses three-digit numbers and any other and any other that follows the first three-digit number must start with a dot or a decimal. The dot or decimal is used in showing divisions and subdivision of disciplines into sections which must follow a sequential arrangement of classes in chains and arrays. Also, you need to understand the rules on how to build numbers considering the order of hierarchy. As a classifier, your main work is to find out the specific subject of a particular document or book from the thought content. Then match the subject with the appropriate number from the DDC schedule. The tools required for the classification of library resources with DDC are the four **volumes of DDC** and a **cutter table**. The four volumes are

a.   Volume 1: Comprises of
    • Introduction
    • Tables
    • Glossary
    • Index to the preface
b.   Volume 2: Schedule Main classes 000 – **599.**

There is the further division of this class into 100 divisions. For example, the
Class 300 - Social sciences, sociology & anthropology
310- Statistics
320 - Political science
330 - Economics
340 - Law

350 - Public administration & military science
360- Social problems & social services
370- Education
380- Commerce, communications & transportation
390 -Customs, etiquette & folklore.

All these subdivisions are further divided into 1000 division called sections. Let us take Economics 330 is divided into sections such as;

Economics 330
331 – Labour
332 – Financial Economics
333 – Land Economics etc.

Such applies to all the main classes in Volume 2 and 3 that are from 000 to 999.

1.   **Volume 3: Schedule** Main Classes 600– **999.**
2.   **Volume 4**: **Relative Index** (which shows the relationship between subject and discipline in which they appear in the schedules of subjects)

The Cutter table which was devised by Charles Ami Cutter in 1800s is used is assigning authors numbers or codes. It is comprised of three letters. In assigning, codes or numbers to authors use the last three letters of the authors' surname which is the last name and search where the last letter falls and copy out the numbers. These numbers from the cutter table are assigned to a subject number derived from the schedule (Classmark) to make up for the class number. The cutter number helps to individualise every document especially when they have the same title as "Introduction *to Classification*" by three different authors.

Steps in Classifying with DDC
•   Determine the subject of the creative work you want to classify.
•   The key elements in determining the subject content are through the following means
a)   Title: The titles sometimes do not expose the content of the document. Also, some of the titles may subtitle which represents a broader topic. At the time you may not understand the subject of a book by just reading the title. So, using only the title might be confusing. So, you need to go beyond the title in determining the subject content of resources.
b)   Table of Content: List of the entire topic discussed in the document to be classified. The chapter and subheadings in the chapters may be of great importance in determining the subject heading of a book.

c)   The Preface or Introduction: Here the author purpose of writing the work is presented. The subject of the work is often expressed here.

d)   Publishers Blurb: This appears at the back of the book as the book jack. A time the summary of the subject content is provided there.

e)   Bibliographical references and index entries can also help you to determine the subject.

- Determine the discipline of the work: after determining the subject of the book or the material to be classified. You should now turn to the schedules. Read through the notes and the manual in the schedule to guide you. The relative index will help you in suggesting the appropriate discipline in which the subject will be treated.

- Where you used the relative index citation in choosing the discipline you must verify it using the schedules.

- Then consult the tables for further divisions and sections. DDC tables are 7 in number treating different scope and areas of coverage concerning the classification of resources. They are as follows;

1.   **Table1**–Standard Subdivision which deals with a View point, the form of the document.

2.   **Table 2**- Areas deals with geographical areas and biography i.e country number, places, rivers. Where you have two countries mention in a title, take the local country first. Example India and the Soviet Union. Take India first before the Soviet Union.

3.   **Table 3** – Subdivision of individual Literature.

4.   **Table 4** – Subdivision of individual Languages.

5.   **Table 5** – Racial, Ethnic, National Groups

6.   **Table 6** – Language

7.   **Table 7** – Person deals groups, professional.

The table starts with the hyphen in classifying, the hyphen should be omitted.   Add a further number using the above table on the subject content Class mark. If the subject heading, of the information material, has a bias towards the racial and language, use table 5 and 6 to add the number accordingly. An example is a book on *British Colonisation in South East Asia* that is a Class number is **325.3410959.**

325.3 =   Colonisation
Britain should come before South
325.3**41** = Colonisation by **Britain**
325.34109**59** = **South East Asia**
09 As directed

Another example is a book on *Research in Psychology*by Joy Chika Purtti.

The Subject here is on *Psychology* but which bias on *Research*
Research is not a **subject,** not a **discipline.**
Psychology is under **Philosophy and Psychology = 100** in the schedule(Volume 2)
Psychology is **150**.
To get Research go to the **Table 1** (which is view point, form of document)
Table 1 - .02 – 08 Standard Subdivision notation
Research – 0.72
Research in Psychology = (150 + 0.72) = **150.072**
Then use the Cutter table to Cutter **PRU = -37**
The final result for *Research inPsychology* by Joy Chika Prutti is,

> **150**
> **.072**
> **.37**
> **PRU**

NB: For further revision and practice listen to this video teaching on practicum on Dewey Decimal Classification Scheme using this links:

- Dewey Decimal Classification Part-1
  https://www.youtube.com/watch?v=0vTHR-gbEwE
- Dewey Decimal Classification Part-2
  https://www.youtube.com/watch?v=j24LWlrzYQ4
- Dewey Decimal Classification Part-3
  https://www.youtube.com/watch?v=wAVWZTHyG9Q
- Dewey Decimal Classification Part-4
  https://www.youtube.com/watch?v=69whWyCHLnU&pbjreload=10
- Dewey Decimal Classification Part-7
  https://www.youtube.com/watch?v=qIL8EGxB55Q
- Dewey Decimal Classification Part-8
  https://www.youtube.com/watch?v=pVMjuTAX7H0

3.2   **Practicum on Library of Congress Classification (LCC) Scheme**

Tools for classification using LCC are as follows:

- Schedules – 41 printed volume showing the Main Class and Subclass
- Library of Congress Subject Heading (LCSH)
- Cutter Table

Each schedule has a preface, content page, and broad outline of the schedule, main body of the schedule, table and index.

Steps you should follow is this
1.   Read through the information material to determine the subject content of the document. So, you need to go beyond the title in determining the subject content of resources. Check the table of content, chapter and subheadings, the preface or introduction and publisher's blurb.
2.   Then from your decision go through the Schedule to ascertain the main class. Like P schedule is for Literature, T is for Technology. You should remember that schedule has the preface, content page, broad outline, main body of the schedule, tables and index. You should familiarise yourself with them do not work in assumptions.
3.   Check through the table to identify the discipline
4.   Add the author number using the cutter table for authors. The author numbers of authors are guided by Anglo-American Cataloguing Rules (AACR2). Such rules are that edited books the first three letters of the title of the book should be used to cutter books as the author. Example

Cataloguing and Classification: An Introduction edited by Peter Umo
        Z
        693
        .C36 (CAT derived from Cataloguing)

For further understanding of this topic watch this video through these links:
Subject analysis, Library of Congress Part 1.

https://www.slideshare.net/Richard.Sapon-White/subject-analysis-
        library-of-congress-classification-part-1

Bothmann, B. (2018). Practical application of Library of Congress Classification   part   2.   (Prepared   for   SELFLIN).
        https://www.youtube.com/watch?v=Oz-v_gzSts8

Bothmann, B. (2016). Library of Congress (LCC): Introduction. (Prepared for Association for Library Collection and Technical Services. https://www.youtube.com/watch?v=Plat61A4NGg

Practicum On Subject Indexes
Subject indexing is the process of assigning terms to represent or describe the thought content or subject matter of documents. These subject indexes are used in creation and maintaining of index file and

retrieval of information from a collection of information resources.The subject index is build using subject headings and keywords. The procedure for subject indexing is as follows:

1.   Provision of information resource to be assigned indexed
2.   **Subject Determination/ Familiarization**

        Read through the information material to determine the subject content of the document. What is the message in the document through reading title sometimes do not expose the content of the document? So, you need to go beyond the title in determining the subject content of resources. Check the table of content, chapter and subheadings, the preface or introduction and publisher's blurb.

3.   **Conceptual Analysis**
        After examining the document to determine that concept content, select the concepts which best described the document.

4.   **Representation of the Concept/ Translate**
        Represent the selected concepts which are in their natural language with the language of indexing system using indexing terms from subject indexing tools like Sears List of Subject Headings or list of subject headings by the American Library Association. You should now cross-check if the concepts in the document matched with the terms with the Thesaurus of the indexing terms in the list of subject headings.

5.   **Cross- Reference**
        Use **"see reference"** to refer the unused term to refer to used term or phrase in the index. Where you have related terms that can be used in describing the concept. You are expected to link the related terms with the used term with a **"See Also reference".**

6.   Then you can now add the locator. The locator can be a number, page number, a figure or a Uniform Resource Locator (URL). When a locator extends across two or more locations it is called locator range but if several locators are attached to the same heading it is called a locator string.

Building Subject Index
Subject Index on Cataloguing and Classification
Abstract Classification 470
Abstracting periods 674, 860
Accession register 24, 36
Adaptation of original works,308

ALA 2018
ALA Draft 56, 97
Alphabetico-classed catalog, 125 – 135
Alphabetical sequence 217
American Library Association (see ALA entries)   ⟹ *Cross Reference*
Anglo-American Cataloguing Rules (See AACR, AACR2)
Author numbers (see Item numbers)
Author tables in LCC class L, 430 – 560Locator String ⟶
BC (BibliographicClassification), 385 – 420
Bias phase, 200   ⟶ **Locator**
Bliss, Henry Evelyn, 385
[See also Bibliographic Classification (BC)] *Cross Reference*

Call number (see Class number; item numbers)
Colon Classification, 506 -535
Complete subject 20
Facet 17 -19
Hulme, E. W. 92
Item number:
        in DDC, 216 – 240
        defined, 250
        in LCC, 420 – 440
For further understanding of this lesson watch this video through these
        links:

How to build an index in word 2007 for dummies.
        https://www.youtube.com/watch?v=nsFp6yc1nxA

Jermey, J (2015). An introduction to book indexing: Terminology
        https://www.youtube.com/watch?v=NPstfRiJU2s

Husain, S. (2017). Index and indexing part 1. Knowledge Management
        System, Department of Library and Information Science lecture
        series 1. https://www.youtube.com/watch?v=VYeTeYC9SUw

4.0   CONCLUSION

The practice is said to lead to perfection. Classification and indexing of
library materials is a continuous activity in any living and growing
library. This is one among the activities produced to users of library
material which is behind the scene. As I librarian you need to master
these skills. The best way of doing it is constant practice on the manual
classification using classification schemes and list of the subject
heading.

5.0   SUMMARY

Having practised, classification of books by assigning class mark, call number and even authors' number to library materials you need to practise more to perfect in the skills. Continue practising the activities in your study centre library with the help of librarians in your study centre library.

6.0   TUTOR-MARKED ASSIGNMENT

1.   State the steps you should take in determining the subject content of an information resource.
2.   Explain "see and see" also referencing.
3.   Explain the step you used in classifying a book using DDC.

7.0   REFERENCES/FURTHER READING

Access Library of Congress and the subclasses online using this link: Library of Congress Classification Outline. https://www.loc.gov/catdir/cpso/lcco/

Cutter Table http://www2.hawaii.edu/~chopey/CutterTa.pdf

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Haidera, S & R. K. Sharmab, R.k (2017). Library of Congress Classification (LCC):   past, present and it is future in the digital era Annals of Library and Information Studies 64, 190-201. https://www.researchgate.net/publication/321127671_Library_of _congress_classification_LCC_Past_present_and_its_future_in_t he_digital_era

Patton, J. (2010) Basics Library of Congress Classification System. https://www.youtube.com/watch?v=Vdh3O5PdEiw

Majumder, A. J. and Sarma, G.K. (2011).Journey of Dewey Classification in the last Decades. *Journal of Department of Library and Information Science*GauhtiUniversity 2(1)164. http://14.139.116.22:8080/jspui/bitstream/123456789/109/1/GS% 207.pdf

UNIT 2   CURRENT TREND IN-LIBRARY CLASSIFICATION

CONTENTS

1.0   Introduction
2.0   Objectives
3.0   Main content
     3.1   Current Trend in Library Classification
     3.2   WorldCat
     3.3   Library of Congress Online Catalogue
     3.4   DeweyBrowser
     3.5   IndCat: Online Union Catalogue of Indian Universities
4.0   Conclusion
5.0   Summary
6.0   Self – Assessment Exercise
7.0   References/Further Reading

1.0   INTRODUCTION

You have learnt about classification schemes and how they can be used in classifying library materials. In this unit, you will learn current trend that is being practised by classifiers to make classification easy and faster.

2.0   OBJECTIVES

By the end of this unit, you will be able to:

- identify the Current trend in library classification
- explain how to use Worldcat in retrieving Subject heading and other bibliographic entries.
- library of Congress Online Catalogue
- explain and the master the skill of retrieve bibliographic details using DeweyBrowser
- understand the use of IndCat in classification in accessing bibliographic details of information resources.

3.0   MAIN CONTENT

3.1   Current Trend In-Library Classification

The most used classification schemes in libraries are the Dewey Decimal Classification (DDC) and the Library of Congress Classification (LCC) schemes. Many libraries cannot afford to buy the

set of the library classification schemes because they appear in volumes LCC has 21 major classes with 41 separate printed volumes while DDC has 4 volumes set of books etc. Also, the application of information technology in library services change the way library materials are acquired, processed, organized and retrieved. The current trend in classification practices is the use of web classification in classifying library information resources (Zaid, 2008). It is not acceptable for libraries to keep acquired information resources in the technical section of the library for an undue length of time as is seen in many libraries. This keeping of acquired information resources for a long period before bringing them out on the shelves for users contradicts the law of library science. the reason for keeping these information resources unprocessed may be due to insufficient manpower, library classification schemes and manual classification and cataloguing is time-consuming and stressful. Web classification was introduced to increase the rate of classification and cataloguing because many libraries now upload already classified and catalogued information resources into their website for you to view and match with your library collection. When the materials your library acquired matches with the bibliographic record online you need not stress yourself doing fresh and manual classification and cataloguing. What you do now is to copy and paste. This process has enabled classifiers to classify many books within the shortest period.

Also, some universities in a country come together under one umbrella to share their library databases thereby forming a union catalogue. You as a classifier can access their union catalogue to help you in classifying acquired information resources. The union catalogue gives you information on the title, author, subject, publisher, and place of publication Classmark, class number and even the authors' number.

Another trend is that some of the information resources that published *now come with their bibliographic records already* classify and catalogued under a heading called **Catalogue In Publication (CIP).** What this means is that you just have to copy or type in the bibliographic details into your library database or library card catalogue and send the information to where the users can access them.

Many classifiers use web facilities in the classification of information resources acquired in the library. The examples of the web facilities used by classifiers in assigning subject headings, class numbers and indexes are Online Computer Library Centres Word-cat, Library of Congress Online Catalogue, DeweyBrowser and IndCat etc.

3.1   Wordcat

The use of Worldcat is one of the current trends in library classification. The Wordcat is a union catalogue that uses the Dewey Decimal Classification (DDC) and Library of Congress Classification (LCC) schemes in classifying and cataloguing of the information resources available in their database. The Worldcat is founded and maintained by the Online Computer Library Centre (OCLC) and its member libraries. Access to the information available in the Worldcat bibliographic records is free. What you require is a computer device and internet facilities to access the required information. to access the bibliographic details of information resources available in the database follow these steps

❖   Select and click on your browser (chrome, internet explorer, etc)
❖   Type in www.wordcat.org
❖   Create an account if you do not have ant with them.
❖   Type in your User name and password to log in.
❖   Click on any Search Option (Basic or Advanced)
❖   Choose the basic search tools: ISBN/ISSN, title phrase, author
❖   Submit your request or query.
❖   It will call up your request, check it with the resources you have at hand. If they are the same copy the bibliographic details for your information resource and move to another unclassified information resources and follow suit.

3.2   Library of Congress Online Catalogue

The use of the Library of Congress Online catalogue is an innovation in classification and cataloguing which started with the application of computers in library services. Classifiers and cataloguers have found comfort and provision of faster services through the use of the Library of Congress Online catalogue in assigning bibliographic details needed in classification and cataloguing of many information resources. It provides basic and advanced search for classifiers and cataloguers but each session expires after 5 minutes. You need to be fast whenever you are viewing or copying the bibliographic details of any available record in the database using this link http://catlog.loc.gov/.
 To access the database, follow this step:

❖   Select and click on your browser (chrome, internet explorer, etc)
❖   Type in http://catlog.loc.gov/.
❖   Select and Click on Basic Search
❖   Select your searching strategy either ISBN/ISSN, title, author/creator, subject in the search box.
❖   Type in your request or query based on your option above

❖ Submit your request or query.
❖ It will call up your request, check it with the resources you have at hand. If they are the same copy the bibliographic details for your information resource and move to another unclassified information resources and follow suit.

3.3 Dewey Browser

The use of Deweybrower in classification is another trend. this involves the use of DeweyBrowser in providing access to millions of records from the Online Computer Library Centre Worldcat database using DDC scheme. You can link to the DeweyBrowser through http://deweybrowser.oclc.org.

To search for subject heading and class number of a document in your library follow this step:

❖ Select and click on your browser (chrome, internet explorer, etc)
❖ Type in http://deweybrowser.oclc.org.
❖ Choose the basic search tools: ISBN/ISSN, title phrase, author in the search box.
❖ Submit your request or query.
❖ It will call up your request, check it with the resources you have at hand. If they are the same copy the bibliographic details for your information resource and move to another unclassified information resources and follow suit.

3.4 IndCat: Online Union Catalogue of Indian Universities

IndCat (http://indcat.inflbnet.ac.in/indcat/) is another classification and cataloguing made easily available online. It is a union catalogue of 189 universities and institute libraries in India. This union Catalogue houses theses, books and journals available in all these institutes and universities libraries. It provides bibliographic information through the title, author, place, publisher, year, subject, and class numbers (Inflibnet Centre, 2020). The IndCat bibliographic information is used for collection development, interlibrary loan; copy classification and cataloguing. To access information from the Union catalogue you have to determine whether you want to search for exact search or free search using a title, author, subject, publisher, place, year of publication, ISBN/ISSN and language or All the listed option. At a point in the search will be asked to redefine your search based on language, edition year of publication, author especially when you have books with the same title with different authors may written in many different languages. You have to redefine your search to indicate the exact title you want. To access the online union catalogue, follow this step:

❖   Select and click on your browser (chrome, internet explorer, etc)
❖   Type in http://indcat.inflbnet.ac.in/indcat/
❖   Decide if you want to use exact search or free search techniques
❖   Select and click on the type of information you are searching for (Theses, Books or Serials)
❖   Click on the next box to select your option of search either ISBN/ISSN, using a title, author, subject, publisher, place, year of publication title in the search box.
❖   Submit your request or query.
❖   It will call up your request, check it with the resources you have at hand. If they are the same copy the bibliographic details for your information resource and move to another unclassified information resources and follow suit.

Also, other trends in library classification are that the classifiers are expected to be information technology literate and should understand different types of metadata schemes developed for classification of information resources.

4.0   CONCLUSION

Every Library needs to classify and catalogue all the information resources available in their libraries irrespective of the challenges of insufficient funding to buy the necessary classification scheme due to poor funding and insufficient trained manpower. A library classification is a must for any library that wants to satisfy the information needs of its users at a record time. This is because when the information resources are classified properly it provides an address to any information resources in the library and links the users to the location of the same information resources on the library shelve. The use of web classification has helped a lot in increasing the speed of classification because it has provided readymade class numbers of many information resources and has saved the time of the classifiers.

5.0   SUMMARY

In this unit, you have learnt about the current trend in the classification of library information resources. The various databases that offer these services and the steps to follow in accessing these databases. You can test your rate of understanding by attempting the exercise below.

6.0   TUTOR-MARKED ASSIGNMENT

1.   What are the current trends in library classification?
2.   Explain the steps you use t in retrieving Subject heading and other bibliographic entries from Wordcat.
3.   Library of Congress Online Catalogue can be as a classifier to do what?
4.   How can DeweyBrowser in the classification of library materials?
5.   IndCat is used by classifiers and catalogue to obtain what?

7.0   REFERENCES/FURTHER READING

Access Library of Congress and the subclasses online using this link: Library of Congress Classification Outline.https://www.loc.gov/catdir/cpso/lcco/

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Majumder, A.J. & Sarma, G. K. (2011). A journey of Dewey Classification in the last four decades. *Journal of Department of Library and Information Science*, Gauhati University2 (1), 164. http://14.139.116.22:8080/jspui/bitstream/123456789/109/1/GS% 207.pdf

Zaid, Y. A. (2008). Cataloguing and classification of library materials: the internet as a tool. In *28th Seminar/Workshop of the Nigerian Library Association. Cataloguing, Classification and Indexing Section* (pp.   46-67). http://repository.unilag.edu.ng/handle/123456789/940