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INFORMATION RESOURCE PROCESSING USING KNOWLEDGE ORGANIZATION TOOLS IN ACADEMIC LIBRARIES: A CASE STUDY OF AHMADU BELLO UNIVERSITY LIBRARY COMPLEX

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ABSTRACT

The paper focuses on using Knowledge Organisation Tools (KOT) for information resources processing in academic libraries, a study of Ahmadu Bello University Library Complex, Zaria. The paper sees KOT as anything use as a device, means, or instrument for processing the understanding, experience, and wisdom of individual(s) to enhance easy access and create value to the knowledge. The study was conducted using descriptive content analysis. It was revealed that professionals and para professionals in academic libraries are involved in using Knowledge Organisation Tools for managing information resources. The paper concludes that, from time to time it may be required to audit and update the Knowledge Management Tools (KMT), information resources and human information seeking strategies in academic libraries to enhance knowledge and meet up with 21st century challenges.

Keywords: Knowledge Organization (KO), Knowledge Organization Tools (KOT), Knowledge Management Tools (KMT), Knowledge Management (KM), Dewey Decimal Classification (DDC), Universal Decimal Classification (UDC), Library of Congress (LC), Program for Cooperative Cataloging (PCC), Machine-Readable Cataloguing (MARC), Anglo-American Cataloguing Rules (AACR)

1. INTRODUCTION

There are many assumptions that organization of information resources can be done easily by applying common sense or, in major research libraries and bibliographical databases, by employing subject specialists, who just apply their special knowledge but with the phase at which information resources are growing, there is need for adoption of Knowledge Oraganisation Tools that are suitable in processing of these information resources for easy storage and retrieval be it Academic. Academic Libraries are libraries that are an integral part of a school, college, university or any other academic institution established to meet the information and research needs of its staff and students.

Chowdhury (2012) sees knowledge as "a product of man's experience, and encompasses the norms by which he evaluates new inputs from his surroundings" [5]. Knowledge consists of facts, perspectives, concepts, beliefs, judgments and expectations, methodologies, and know-how and much more Mohammed (2003) [13]. However, knowledge is abstract and it can be transferred through shared experience tacitly and explicitly which is seen today as the main category of knowledge. Tacit knowledge is hidden knowledge buried in the memories of people. It includes what is learnt from doing, observation, informal information and even gossip. It's more difficult to recognize, collect, codify, store and distribute because this happen mostly when individuals are having conversion since it is not planned nor has limit. Myongho (2006) supported the above view that "tacit knowledge is unarticulated and unrecorded [14]. While explicit knowledge is knowledge that is articulated or recorded in a way that enables knowledge to be shared or transferred. Also it may be recorded in reports, books, technical papers, memos, minutes of meetings, data bases, photos, videos, audio recordings e.t.c., and these records may be published or unpublished. According to Suliman (2002) explicit knowledge is a substantial documented knowledge patterns, technical specification and procedures. It is information that is routinely collected, stored and distributed [18]. Kiehl (2004) pointed out that for knowledge to be transferred it must be made explicit, so that they can be communicated [11]. However, the following are examples of both tacit and explicit knowledge in Ahmadu Bello University Library Complex.

Table 1: Types of Knowledge in the Library

S/N	TACIT KNOWLEDGE	EXPLICIT KNOWLEDGE
1	Meetings	Books
2	Answering Queries	Reports
3	Conversation	Newspapers
4	Teleconferencing	Journals
5	Telephone conversation	CD Room
6	Conferences	Databases
7	Workshops etc	Cassettes (Tape & Video) etc

2. AHMADU BELLU UNIVERSITY LIBRARY COMPLEX

Established in 1962, the University Library Complex of Ahmadu Bello University comprises the Kashim Ibrahim Library (the main Library), eleven other satellite libraries and about 80 faculty and departmental libraries located in different campuses of the University. The Library Complex has a total holding of over 1.7 million volumes of books and 120,000 periodical titles. The University library complex has always been at the centre of research and scholarship playing a major role in acquiring, processing and lending library materials and responding to patrons inquires. Today, online database and internet searches are a common feature among staff and students of the University. The library management in the past few years has been striving to upgrade the IT skills of the staff to enable them cope with challenges of the information age. Recently, thanks mostly to donations by the MacArthur Foundation and the Carnegie Corporation, rapid progress has been made not only in updating the collection, but also in automating the resources and services of the Library Complex. Today, online and CD-ROM searches are a common feature among staff and students of the University. With staff strength of about 100 professionals and 258 Para-professionals, 22 Senior and 152 junior nonprofessional staff in the entire university library complex, the library management is striving to upgrade the IT skills of the staff to enable them cope with challenges of the information age.

The satellite libraries are: President Kennedy Library , Law Library, Centre for Islamic Legal Studies Library, Institute for Agricultural Research Library, The National Animal Production Research Institute Library (NAPRI), National Agricultural Extension and Research Liaison Services Library (NAERLS), Medical Libraries (Clinical and Preclinical), Lee T Railsback Library (Veterinary Medicine), Arewa House Library, Division of Agricultural Colleges Library (DAC) and Abdullahi Muhammad Public Library.

3. PROBLEM STATEMENT

Due to the influence of technological advancement which creates changes in both socio-political and economic situations, hence automatically brings a change in the information needs of people in the 21st century. In today's context, people want to have value added and customized information that would help in problem solving and creative thinking with this, librarians and information managers are forced to centre their interest on ways which information resources can be processed, stored and retrieved easily. This leads to the study information resources processing using Knowledge Organization Tools in academic libraries: a case study of Ahmadu Bello University library complex

4. OBJECTIVES

The main objective of the study is to establish the effectiveness and efficiency of Knowledge Organization Tools in information resources processing in academic libraries. Others include the following:

1. To examine the process of knowledge creation, storing, sharing and distribution;
2. To investigate the initiatives to survive the knowledge-based economy by academic libraries
3. To provide suggestion on how to support and sustain information processing using knowledge organisation tools in academic libraries.

5. KNOWLEDGE MANAGEMENT

The concept of Knowledge Management (KM) is becoming prevalent in the academic and professional libraries and information science literatures. However, knowledge management is a very complex problem and can be tackled from several viewpoints: socio-organizational, economical, technical, human, legal etc.

Blair and Ghaziri (2004) defines KM as " a systematically and organizationally specified process for acquiring, organizing, sustaining, applying, sharing and renewing both the tacit and explicit knowledge to enhance performance and create value to the institution" [3]. Furthermore, knowledge management is essentially a four-step process that includes capturing, organizing, refining and disseminating information. The process begins with the capturing of information relevant to the activities and interests of people in an Institution/organization. Such information may be available in a variety of sources, forms and formats. Once information is captured, it needs to be organized using a number of techniques that include cataloguing and indexing, filtering, ranking, and so on.

6. KNOWLEDGE MANAGEMENT TOOLS

Knowledge Management Tool (KMT) is an important instrument use in the library system and services for acquisition, organisation, retrieval, dissemination, maintenance and evaluation of information and information resources.

Knowledge management tools are designed to facilitate knowledge management, whether they are physical items, such as file cabinets, computer systems and programs, information organisation schedules, or training sessions used to verbally share work practices etc Zietz, (2006) [19].

7. KNOWLEDGE ORGANIZATION

The narrow meaning Knowledge Organization (KO) according to Hjorland (2009) is about activities such as document description, indexing and classification performed in libraries, bibliographical databases, archives and other kinds of "memory intuitions" by librarians, archivists, information specialists, subject specialists, as well as by computer algorithms and laymen. In the broader meaning KO is about the social division of mental labor, i.e. the organization of universities and other institutions for research and higher education, the structure of disciplines and professions, the social organization of media, the production and dissemination of knowledge [10].

7.1 Traditional Approaches to Knowledge Organization

Knowledge organization is about organizing objects of thought in such a way that humans can access and retrieve information, Siegel (2002) [16]. Knowledge organization usually deals with documents and metadata (information about information), Garshol (2005) [15].

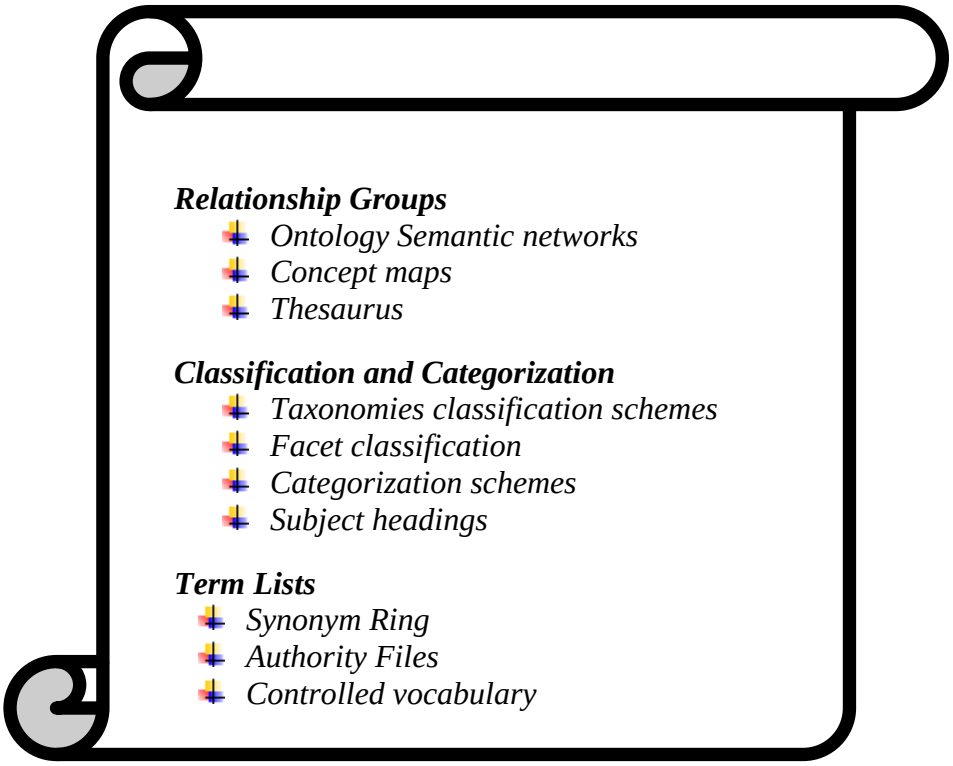


Figure 1: Approach to knowledge organisation

Most traditional approaches to knowledge organization techniques, such as thesauri and taxonomies, come from the field of Library and Information Studies (LIS). Zeng (2005)

explains that knowledge organization can be divided into three types. These include term lists, classification/categorization, and relationship groups. The specific types are grouped into general categories -- term lists, which give emphasis to lists of terms; classifications and categories, which underline the construction of subject sets; and relationship lists, which emphasize the connections between terms and concepts [9].

a. Relationship Groups

Thesauri, concepts maps, semantic networks, and ontology are some approaches used to represent relationships among resources. Building relationships among resources is necessary as information becomes complicated, unstructured, and more extensive. Provision of relationships among well-classified information representations enables effective and efficient navigation and collocation.

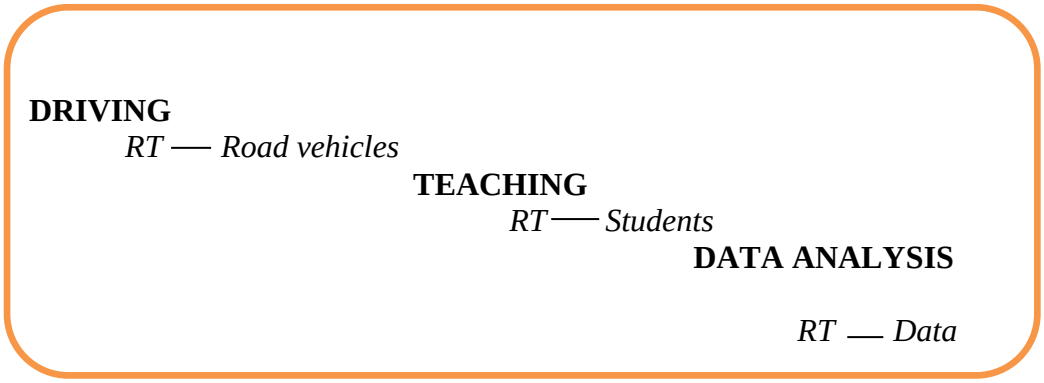


Figure 2: Example of an Associative Relationship

However, building associative relationships is not an easy task, and associative relationships are more difficult to define than equivalence and hierarchical relationships, Aitchison et al (2000) [1]. Associative relationships have been used more often in pure sciences and in technology than in the social sciences and humanities. Associative relationships can be risky because each individual has different perspectives on relationships which may impair precision performance. In fact, there are no precise rules for establishing associative relationships, and this is one of the major limitations of associative relationships.

b. Classification and Categorization

Lists of terms do not provide much structure, which makes searching for specific information difficult. Using classification and categorization, structure may be added to enhance information retrieval. McGuiness (2001) pointed out that, "the Web environment has raised the importance and value of existing KO tools, such as classifications, thesauri, taxonomies, subject-heading systems etc. These are now claimed to have an enormous potential, not only in being applied to the self description of individual Web documents but also in supporting search and retrieval services provided by agencies other than libraries. This is evident from both the current literature on the matter and from the number of projects, agencies and metadata schemes, etc. that recommend or refer to the use of traditional library KO tools. Apparently, these are ready to use and well credited because they are professionally prepared resources and because they reflect literary warrant" [8].

c. Term Lists

There are many possible organizing principles for documents such as by author, by time period, etc. Keywords are a primitive form of subject-based classification. The simplest form

of controlled vocabulary is a list of terms. In the Library and Information Science (LIS) field, terms are words or phrases and concepts are what the terms refer to Garshol (2005) [15].
Furthermore, not only ontology have emerged "from academic obscurity into mainstream business and practice on the Web" McGuiness (2001) [8], but also the Web environment has raised the importance and value of existing KO tools, such as classifications, thesauri, taxonomies, subject-heading systems etc . These are now claimed to have an enormous potential, not only in being applied to the self description of individual Web documents but also in supporting search and retrieval services provided by agencies other than libraries. This is evident from both the current literature on the matter and from the number of projects, agencies and metadata schemes, etc. that recommend or refer to the use of traditional library KO tools. Apparently, these are ready to use and well credited because they are professionally prepared resources and because they reflect literary warrant.

7.2 Knowledge Processing/Organization Tools in Academic Libraries

Knowledge Processing is the sciences concerned with gathering, manipulating, storing, retrieving, and classifying recorded information. Knowledge processing is about organizing objects of thought in such a way that humans can access and retrieve information, Siegel (2002) [16]. All the knowledge organization tools developed till date attempt to organize the universe of knowledge based on the fundamental subjects or subject groups. The core objective of all these knowledge processing tools is to provide immediate and precise information to users as per their information requirements.
Libraries and information services have a long history of using various tools for organizing knowledge resources. The following types of approaches are used to organize information objects according to Zhu (2002):
(1) Classification schemes like: Dewey Decimal Classification, Universal Decimal Classification, Library of Congress Classification, Bibliographic Classification, Colon Classification, etc.
(2) Subject heading lists like: Library of Congress Subject Headings, NLM Subject headings and MeSH, Engineering Information Classification Scheme, Humanities and Social Science Electronic Thesaurus, e.t.c [20].
Other tools used are: Authority Files, Greenstone, Dictionaries, Shelve List, Online Public Catalogue (OPAC), Online Subject Heading, Machine-Readable Cataloguing (MARC), Integrated Library System, Dublin Core, Resources Description and Access, Online Union Catalogue, Anglo-American Cataloguing Rules (AACR), and Library Databases Chowdhury (2012) [5].

7.3 Major Standard Tools of Knowledge Organisation in Academic Libraries

Different libraries have different tools for processing information resources in the library, some are locally designed while some are general accepted standard tools; little among them are the follow:

I. Resource Description and Access (RDA)

Designed for the digital world and an expanding universe of metadata users and is the new unified cataloguing standard - an evolution of the cataloguing principles from AACR2, the second edition of the Anglo-American Cataloguing Rules, with rules carried over or adapted to the RDA model. The content of RDA has been developed in a collaborative process led by the Joint Steering Committee. The project is overseen by the Committee of Principals representing the American Library Association (ALA), the Canadian Library Association (CLA), UK's CILIP: Chartered Institute of Library and Information Professionals, United States Library of Congress, Library and Archives Canada, British Library, and National Library of Australia. JSC was previously responsible for maintenance of the Anglo-American

Cataloguing Rules, which RDA has been developed to replace. Thus, is use in processing information resources in libraries ranging from printed, non printed, electronic information resources e.t.c.

II. Anglo-American Cataloguing Rules (AACR)

The Anglo-American Cataloguing Rules are "designed for use in the construction of catalogues and other lists in general libraries of all sizes. The rules cover the description of, and the provision of access points for, all library materials commonly collected at **its p time."** The rules are published jointly by the American Library Association, the Canadian Library Association, and the UK's CILIP: Chartered Institute of Library and Information Professionals. It is use in cataloguing information resources in the mostly academic libraries.

III. Library of Congress Classification Scheme (LCC)

The LCC was initially designed at the beginning of the 20th century for the collection of the Library of Congress (LC). Since then, many other large American academic and research libraries have adopted it. http://www.loc.gov/cds/products/1cClass.php. It is use in classifying information/knowledge product in the library system.

IV. Dewey Decimal Classification Scheme (DDC)

The DDC system, devised by library pioneer Melvil Dewey in the 1870s and owned by OCLC (Online Computer Library Center, Inc) since 1988 (through its purchase of Forest Press), provides a dynamic structure for the organization of library collections. Now in its 23rd edition and available in print and in Web (as WebDewey) versions, the DDC are the world's most widely used library classification system, available directly from OCLC Dewey Services, at: http://www.oclc.org/dewey . Also use in classifying information/knowledge product in academic library.

V. Cutter Tables

Usually libraries using Dewey use a "Cutter table" to assign specific author numbers. OCLC now freely provides the Dewey Cutter Program: The Dewey Cutter Program is a software program that automatically provides cutter numbers from the OCLC Four-Figure Cutter Tables (Cutter Four-Figure Table and Cutter-Sanborn Four-Figure Table) upon input of text. It works with most Windows versions, and enhances your classification efficiency.

VI. Subject Headings

Adding subject headings to a catalogue record allows the catalogue user to retrieve all items on a given subject in a consistent manner. In the United States, there are two commonly used sets of subject headings, whose latest editions are:

- The Library of Congress Subject Headings, 34th edition (2012), available online as part of Classification Web, at: http://www.loc.gov/cds/products/product.php?productID=209
- The Sears List of Subject Headings, 20th Edition (2010), published by The H.W. Wilson Company; there is a Sears List of Subject Headings Online database by EBSCO publishing, while the print publication version is currently provided by Salem Press, at: http://salempress.com/Store/samples/sears/sears.htm

VII. Machine-Readable Cataloguing (MARC)

MARC has been the standard in library automation for nearly 30 years. It forms the backbone of today's automated library systems, networks, and bibliographical utilities around the world. The MARC format is the data communication protocol for "translating" the text of a catalogue record for use in an online catalogue. The MARC products developed at the Library of Congress set the standard for MARC cataloguing documentation. The Library of Congress, the British Library, and the National Library of Canada harmonized the USMARC, UKMARC, and CAN/MARC formats, and joined their MARC documentation to form MARC 21. All USMARC products have become MARC 21 products.

VIII. Classification Web

Search, browse, and access all Library of Congress Classification schedules and Library of Congress Subject Headings and Name Headings on the Web. Construct, verify, and assign classification numbers, subject headings, and name headings to library material using the most current data. Classification Web is the only web-based subscription service to offer you all this and it's updated every day. Now with a new interface that features clearer displays, less clutter, and expanded correlations.

IX. Cataloguer's Desktop

More than 300 of the most important cataloguing and metadata resources including, among many other indexed or linked resources, AACR2, Describing Archives: a Content Standard *(DACS)* from the Society of American Archivists, and RDA: Resource Description and Access etc

X. Library of Congress Online Catalogue

The Library of Congress Online Catalogue is a database of records representing the vast collection of materials held by the Library. In addition to these records, the Online Catalogue provides cross-references, notes, and circulation status, as well as information about Library materials still in the acquisitions stage. Library of Congress Authorities allows browsing and viewing of authority headings for Subject, Name, Title and Name/Title combinations; and download authority records in MARC format for use in a local library system. This service is offered free of charge.

XI. WebDewey 2.0

It is online tool that provides access to an online version of the Dewey Decimal Classification system. Automatically updates with the newest DDC data and information. It helps in cataloguing information resources in the library.

XII. Online Computer Library Center Cataloguing (OCLC) and Metadata

OCLC services include integrated online cataloguing, custom and copy cataloguing and a variety of metadata services.

7.3 Programs that Help Knowledge Managers in Processing Information Resources in Libraries: Program for Cooperative Cataloging (PCC)

The Library of Congress operates as a permanent member of this program and serves as the PCC Secretariat to coordinate, support, and provide service to members in the various component programs of the PCC: Name Authority Cooperative Program (NACO), Bibliographic Record Cooperative Program (BIBCO), CONSER (Cooperative Online Serials) Program, and Subject Authority Cooperative Program (SACO).

The Program for Cooperative Cataloging (PCC) is one of two cooperative cataloging ventures. The PCC is an international cooperative effort aimed at expanding access to library collections by providing useful, timely, and cost-effective cataloging that meets mutually-accepted standards of libraries around the world. PCC programs that serve as information retrieval and dissemination tools which help in processing library information resources include:

a) **Monographic Bibliographic Record Cooperative Program (BIBCO)**

Members contribute high quality bibliographic records that conform to approved standards.

b) **Cooperative Online Serials Program (CONSER)**

Members create high quality bibliographic records for serials and integrating resources that conform to approved standards.

c) **Name Authority Cooperative Program (NACO)**

Members input authority records for personal, corporate, and jurisdictional names; uniform titles; and series headings to the LC/NACO Authority File.

d) **Subject Authority Cooperative Program (SACO)**
Members propose LCSH subject headings and LCC classification numbers to the Library of Congress. http://www.loc.gov/aba/pcc/

e) **National Union Catalog of Manuscript Collections (NUCMC)**
This program provides and promotes bibliographic access to the nation's documentary heritage by providing bibliographic access to archival collections held by eligible archival repositories throughout the U.S. and its territories, and by providing free searching, via a NUCMC gateway, of archival collections in OCLC WorldCat.

f) Catalogers Learning Workshop (CLW)
This website provides access to professional training resources related to the organization and classification of bibliographic information. All CLW course materials are available free of charge in PDF format.

g) Cooperative and Instructional Programs Division (COIN)
As of October 1, 2008, LC staff that work directly in support of the PCC and NUCMC programs merged into the newly formed COIN Division of the Acquisitions and Bibliographic Access Directorate. This merger into a single division achieves greater efficiencies in cooperative ventures, stimulates their growth and visibility, and enables staff members working in these two areas to provide better support and service to the members of the programs.
http://www.loc.gov/catdir/cpso/coopcatprog.html

8. CONCLUSION
Due to the influence of changing socio-political and economic situations, there is a marked change in the information needs of people in the 21st century. Furthermore, there is change in the information requirements and rapid growth in scientific knowledge in the past few decades and the emergence of Internet and World Wide Web as major repositories of knowledge/information. Because of these factors the knowledge organization tools developed based on the fundamental subjects are unable to satisfy the information requirements of the 21st century information resources.

9. RECOMMENDATION
It is recommended that from time to time it may be required to audit and update the Knowledge Organisation Tools, information resources and human information seeking strategies in academic libraries to meet up with 21st century challenges, thus compelling information professionals all over the world to find solutions to the problem of information packaging, storage, processing, retrieval and dissemination, for the fact that people want to have value added and customized information/information resources that would help in problem solving and creative thinking.

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