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Bibliotaxonomy: Definition, Scope and Implication for LIS Scholarship

by

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Abstract

The paper introduces bibliotaxonomy as a generic name for those aspects of Library and Information Science (LIS) scholarship that deal with the processing and organization of books, documents and other information materials. It traces the origin of, and inspiration for bibliotaxonomy to different taxonomic practices in various communities, societies, as well as earlier philosophical and botanical classifications. A sketch of the contours of the field of bibliotaxonomy was presented which shows that this phenomenon cuts across specific library technical services of cataloguing, classification, indexing and accessioning. In addition, successful application of taxonomic principles from other disciplines in the organization of knowledge was highlighted and clarified. Some of the implications of the adoption of bibliotaxonomy would be increased interdisciplinary collaborations, deepened librarianship-inspired taxonomic researches, emergence of recognizable areas of specialization in LIS, more visibility for document taxonomists, and societal appreciation of the role and influence of taxonomic principles in the practice of librarianship. The paper concludes that bibliotaxonomy is a preferable academic nomenclature considering that the underlying philosophy has been tried and perfected in other disciplines with amazing results. The recommendations of the paper include: regular use of the term "bibliotaxonomy" in LIS researches, acceptance of bibliotaxonomy as an area of academic specialization for LIS scholars, increased funding of bibliotaxonomic researches and regular academic collaborations amongst taxonomists in various disciplines.

Keywords: Taxonomy, Bibliotaxonomy, Organization of Knowledge, Technical Services.

Introduction

There can be no end to ideas and knowledge. It is ideas properly fashioned and pursued that eventually catalyze as accomplishments. In most cases, the aggregate of such successes translates to professional and societal progress. The innovations unleashed in different areas of human endeavours were oxygenated by the musings of those who were unafraid to share the

result of their meditations. Most big accomplishments started as thoughts that seemed impossible when first conceived and canvassed. Some ideas are completely virgin having invaded the imaginations of the vision-bearer on the spur of divine inspiration. Others come from constant and concentrated study of some concepts during which inspiration is dawn to interpret other phenomena, reconstruct existing practices and widen disciplinary boundaries.

The idea canvassed in this paper is premised on the last sentence of the preceding paragraph. Professions regularly borrow ideas to redefine themselves, broaden their reaches and improve their public perception. Librarianship is not an exception. The ability to adapt knowledge from various areas establishes it as a multidisciplinary profession. The result is that LIS curriculum planners regularly tap ideas from other fields to deepen the LIS course content. In fact, some of the principles that underpin most of the practices that define the profession came from other disciplines. Ready examples include compilation of bibliography, printing/publishing, ICT and customer services. Indeed, there can be no end to academic reflections, reinterpretations and reconstructions. The novelty being introduced has its root in taxonomy. The concept of taxonomy originated from the human historical practice of naming and organizing things. Every human society gives its members names which are, more often, interpretations of certain occurrences as generally understood in the linguistic group. History has documented some of these instances. It is, therefore, impossible to discountenance the influence of the Bible in the historical evolution of taxonomic procedures.

Perhaps, the earliest documented practice of taxonomy occurred in the creation story in Genesis. The first instance was when God "separated" the light from the darkness and subsequently "called" the light "day" and the darkness "night" (Genesis 1: 4-5). The principles and practice of taxonomy manifested again in Genesis 2: 19-20, when Adam gave names to every creature! Since then, most societies and cultures practice taxonomy in various ways as reflected in names, words and languages. These have continued to serve as means of identification and expression (communication) within every community and culture. The taxonomic significance of names is evident in the fact that they are also used to arrange and organize things. In so doing, it becomes easy to distinguish between people using their names. This use of names could be assumed as the first attempt at classification because it helped to identify and distinguish between people. By extrapolation, taxonomy also helps to identify, distinguish, locate and use things. In the same token, name can be the basis to replace or return the items so used to their original position. It can therefore be posited that while naming is the first major objective of taxonomy, characterization remains, logically, the second.

Taxonomy has evolved over the years and is now generally accept to mean the formal rules and systems used to classify things and objects. The underlying ideas and principles in taxonomy have been adapted and applied in various disciples. For instance, in biology, the practice of taxonomy obviously influenced the rise to prominence of the sub-discipline of systematics which covers all of comparative biology. Systematists who develop formal biological classification and publish taxonomical revisions and keys are practicing taxonomy (Wiley, 2007). Educational psychologists have applied taxonomic ideas to classify or categorize

learners and stages of learning. This has implications for various levels of education because different curricula have been designed to suit all stages of learning. It is also evident that astrologers borrowed some inspiration from taxonomy in placing stars into classes in line with their physical sizes and degree of brightness. Considering that taxonomy deals with classification and organization, it needs neither rocket science nor vigorous literary analysis to understand and appreciate that Library and Information Science (LIS) scholars have practiced the art of taxonomy in the course of the evolution of their profession. This is because the technical processes associated with organization of books and other documents closely mirror taxonomy.

Taxonomy has developed into the accepted academic and scholarly designation for identification and classification of things, especially, organisms. This much is evident in the works of great scholars and biologists like Aristotle (384 - 322 BCE), Theophrastus (ca. 370 - 285 BCE), Albertus Magnus (1193 - 1280), Averroes of Cordoba (1126 - 1198), Konrad Gesner (1555 - 1558), John Ray (1627 - 1705), Augustus Rivinus (1652 - 1723) and Joseph de Tournefort (1656 - 1723), amongst others. It was, largely, from the investigations and writings of these forerunners that the ideas of modern taxonomy began to firm up from the 19th Century. Even Charles Darwin (1809 - 1882), the great natural historian and botanist, inadvertently applied taxonomic ideas in fashioning those cerebral ideas canvassed in the *Origin of Species* (1859). This much can be inferred from the references to "natural selection" and "survival of the fittest". The concept of natural classification which is built around the principles of evolutionary descent and common ancestry relationship, unarguably, benefitted from taxonomic idea. This idea has further crystallized in the 20th Century as the dominant paradigm of biological classification. Modern taxonomists not only widened the scope of taxonomic nomenclature, they employed words/concepts like genus, genera, specie, class, order, section, family, archetype, hierarchy and domain to identify, classify, characterize, rank and distinguish between organisms and specimens.

The principles underlying taxonomy has been imbibed in the naming and characterization of objects and samples. This claim is, implicitly, corroborated in the preceding narrative. The increasing interrogation of this concept is responsible for its mutation in various disciplines. This multiplication is signposted by such phrases as folk taxonomy and scientific taxonomy. Equally noteworthy, is the fact that biologists have employed taxonomy the most. The reward is the multiple areas of academic specialization that have become the pathways to several scientific discoveries. Hence, if biologists who have studied taxonomy extensively now uses the term to describe those aspects of their field that deal with identification, characterization and naming of plants and animals (plant taxonomy and animal systematics/taxonomy), and if folk taxonomy captures the identification of names and languages developed in different cultures, then the time has come for the librarian to explore bibliotaxonomy.

Definition and Concept Clarification

Bibliotaxonomy is a concept created by the fusion of two words that have made profound impact in education generally, and science in particular. The first is "biblio" which is a Latin

word for the generic "book". The other component is, unarguably, "taxonomy" which literally means "the human activity of naming organisms and organizing these names according to a given criterion" (Wiley, 2007 p. 181). Taxonomy has been further clarified as "the scientific process of classifying things" (Hornby, 2010). These definitions draw attention to the existence of books (biblio) that have to be classified and/or organized according to certain rules (taxonomy). Hence, bibliotaxonomy was coined as a single term that depicts the identification, classification and arrangement of books, documents and other written records.

Bibliotaxonomy is both a set of activities and a field of academic-cum-research specialization. From the working definitions given above, the set of activities that constitute bibliotaxonomy have direct bearing on what is generally known as "organization of knowledge". As an area of research interest, it focuses on the evolution and development of various systems and methods used to organize books, documents and other recorded knowledge in libraries, archives and other bibliographical institutions. The term bibliotaxonomy is, therefore, much narrower than library technical services. In fact, it aims at deconstruction of the rather unwieldy technical services in order to isolate those aspects that directly address organization of physical records in various document repositories. A further aim is to fashion a more academic and scholarly name for those activities that constitute the organizational elements of library technical services.

Although the term "bibliotaxonomy" is a new addition to the LIS lexicon, a careful reflection on its meaning and sustained interrogation of the literature reveal that the imprimaturs of this phenomenon has been part of librarianship since time immemorial. Aspects of it have been practiced in various ways since the emergence of the oldest libraries. This is because, libraries always devised various means of identification, arrangement and retrieval of materials in their collections. It is easy to notice traces of what has become known as accessioning, cataloguing, classification and indexing. These processes come under the ambit of library technical services which have been defined as "those tasks associated with bringing materials into the library and making them ready for the general public or service population to use" (Evans, Intner & Weihs, 2005 p. 3). However, the introduction of bibliotaxonomy unbundles the larger technical services such that attention is directed at the processing activities that result in organization of information and knowledge artifacts. Hence, bibliotaxonomy represents a more academically-recognizable nomenclature for those library chores that lead to classification and organization of items in the collection. Each of these activities is specialized in nature and requires certain training, skills, experience and technical competence. Their correct interpretation and application is at the core of the library's ability to meet the information needs of the patrons. It is for these reasons that document processing services in the library is usually described as the heart of technical services. On the basis of the foregoing, therefore, it is easy to posit that bibliotaxonomy and its core satellites like accessioning, cataloguing, classification and indexing reside within the bowels of library technical services.

The category of information professionals that specialize in the identification, classification and organization of books and other published materials that constitute the library's

collection are the bibliotaxonomists. This means that bibliotaxonomist is a general umbrella name for librarians with specialization in the library's technical operations of accessioning, cataloguing, classification and indexing. Of course, individually, they remain cataloguers, classifiers/classificationists and indexers. A library is, therefore, as good as its pool of bibliotaxonomists. They are the intellectual force behind any successful library, archive and document repository. This is because, the bibliotaxonomist, based on the earlier definition and clarification, is responsible for establishing that orderliness which facilitates easy access and retrieval of information materials from the physical and virtual collections. It is the physical and mental exertions of the bibliotaxonomist that yield such retrieval tools as the library catalogue, index card, shelf guide, bibliography. Hence, the library cannot live up to the fourth law of Library Science to "save the time of the user" (Ranganathan, 1961) if there is no corps of bibliotaxonomists to process and organize the available books and other documentary sources. Even in contemporary time when most libraries have mixed collections (made up of print, electronic and audio-visual), it is the expertise of the bibliotaxonomist that brings order and create access tools to the diversity of information resources. This clearly means that those ancient library practitioners and philosophers who devised different methods of organizing library materials are, in reality, the earliest bibliotaxonomists. The same is true of the contemporary librarian, library educator and ideologue who write on different aspects of accessioning, cataloguing, classification and indexing. It is the crude ideas and amateurish document organization practices of the old, modernized over the years through researches and repeated experimentations, that is being reinterpreted and dressed in a more scholarly robe called bibliotaxonomy.

Scope of Bibliotaxonomy

In surveying the landscape of bibliotaxonomy, the exercise has to be guided by the understanding that this concept was coined to serve as a fitting uniform nomenclature for those areas of library practice and LIS scholarship concerned with the identification, description, classification and organization of records in libraries and allied information repositories. The inspiration for this coinage was drawn from the general acceptance of taxonomy as the study of the development of classification systems for things and organisms (Blackwelder, 1967 and Wiley, 2007). This fusion of "biblio" and "taxonomy" represents a more academic label for a field of study. In a gathering of scholars of heterogeneous educational backgrounds, it will certainly be easier for non-initiates into LIS to identify with "bibliotaxonomy" as an academic or professional specialization than either of "organization of knowledge" or the broader "library technical services" which have been in use. This is more so as the identical or closely-related areas in other disciplines now have names with the taxonomy suffix. Reference has already been made to the emergence of plant taxonomy, animal taxonomy, bacterial taxonomy, folk taxonomy, etc.

In sketching the contours of bibliotaxonomy, recourse is made to the key words in its generally-accepted definition. The logic of this approach rests on the fact that taxonomy and its

application to other fields of study influenced the creation of various taxonomic nomenclature. The key words in any good definition of taxonomy is quite revealing. These major words and phrase are: "naming", "characterize", "arrangement", "organism" and "according to a given criterion" (Wiley, 2007 p. 181). Instructively, these words and phrase are used in similar context in librarianship and LIS education. This is because, for instance, "naming" approximates choosing appropriate tag or designation for subject of the book. Both "characterize" and "identification" can easily replace "classification or subject cataloguing". The term "organism" as used in definitions of classical taxonomy can be easily substituted with "books and other information materials" which is what the library classifies and organizes. The phrase "according to a given criteria" sounds familiar as any basic textbook on "organization of knowledge" informs and reminds the reader that books are catalogued, classified or arranged using certain parameters (Kumar & Kumar, 2010 and Kumar, 2011).

Based on the analysis and explanation in the preceding paragraph, it can be concluded that bibliotaxonomy covers distinct aspects of library technical services, namely: accessioning, cataloguing, classification and indexing. Going by the narrative so far, only a few pundits, if any, will dispute the inclusion of cataloguing in the architecture of bibliotaxonomy. In the words of Kumar and Kumar (2010 p. 352), "cataloguing is one of the oldest library crafts". The initial aim of cataloguing was to produce inventory or list of library books. As time went on, the library catalogue evolved into a major tool for document identification. However, the functions performed by the early catalogue and construction of this device were largely defined by traditions inherited in individual libraries. This was to change in 1841 when Anthony Panizzi, then Librarian of the British Museum, produced the first codified rules for cataloguing library documents. Through cataloguing, the librarian lists documents which form the holdings of the library. The idea is to provide a key for the location and retrieval of items from the collection.

The literature of taxonomy even makes reference to "description". This is noticeable in the statement that "modern taxonomies include detailed descriptions of the organisms and a history of the various names by which these organisms have been called" (Wiley, 2007 p. 182). The term "description" closely approximates "cataloguing" which, in the context of LIS, can simply be defined as the process of preparing a library catalogue. It is also regarded as the preparation of bibliographic records (Wynar, 1985) and the bibliographic description of books and other documents in the library (Nnadozie, 2007). However, as with taxonomy, there is more to cataloguing because it is an activity fraught with observance of rules, patterns and conventions. This fact is brought to the fore in another definition that sees cataloguing as "the systematic identification and recording of the physical properties or features of a document in terms of authorship, title, place of publication, publisher, date, pagination, illustrations, etc (Nnadozie, 2007 p. 29). Although, it could be said that cataloguing is to the librarian, what description is to the taxonomist, the aim of both specialists boils down to listing, itemization or numbering of things. And the listing is both systematic and procedural. The use of "detailed" to qualify "description" (Wiley, 2007) instantly elicits the imagery of either of middle (second) and maximum (third) levels of description in cataloguing. Hence, bibliotaxonomy includes the

bibliographic description of the books in a library in order to facilitate access, identification, retrieval, dissemination and use.

The next activity within the purview of bibliotaxonomy is classification. In the library work flow, cataloguing precedes classification in the scheme of technical service activities. This is captured in the phrase "cataloguing and classification". Taxonomists make reference to classification through words like grouping, organization, characterization and systematics. In taxonomy, the ultimate aim is to organize the world around us using names. This concept has been borrowed and replicated in various disciplines. Thus, the animal and plant taxonomists organize animals and plants, respectively while the librarian classifies and organizes books. The grouping (organization or classification) is carried out by each of these professionals "according to a given criterion" (Blackwelder, 1967 and Wiley, 2007). This "grouping of things" has been one of the central features of the practice of taxonomy over the years. The names, words and languages found in various societies and cultures bear several imprimaturs of taxonomic practice. For instance, Adam (arguably, the first human to practice taxonomy) must have named things based on certain criteria. Perhaps, it is a moot point that if Adam didn't see any differences between the things (especially, plants and animals), he would not have given them separate names! Even the name "Eve" has some significance as evident in the statement that "this is the bone of my bone and flesh of my flesh, she shall be called 'woman', for she was taken out of man" (Genesis 2:23). The words used in that excerpt and the purpose intended make it difficult to overlook the influence and/or contributions of the Bible in the development of taxonomic practices.

Aristotle (384-322 BCE), perhaps the earliest recorded taxonomist after Adam, classified animals with similar characteristics and recognized those with blood (vertebrates), those without blood (invertebrates), shelled animals and plant-like animals. Theophrastus (ca. 370-285 BCE), a protégé of Aristotle, classified plants based on their forms (trees, scrubs, herbs, etc). In 1583, Andrea Cesalpino, the Italian physician, published *De Plantis Libri XVI* which contained a classification of plants according to their seed types, fruits and forms. In librarianship, books have always been arranged, as long ago as the human memory can recollect. This classification started with the crude or simple separation of records (cunie forms or clay tablets, parchment, cordex and later books) based on such physical attributes as binding colour, size and date. This practice was later perfected with the introduction of subject cataloguing which entails grouping of documents according to their content as first mooted by Andre Crestadoro. In fact, it was Crestadoro who for the first time in his book *The Art of Making Catalogues* published in 1856 hinted that the cataloguer should provide a standardized guide to the subject content of a book by giving it a heading (Chakraborty & Chakrabarti, 1984 p. 186). The suggestion was later actualized and popularized by Charles A. Cutter when he produced the first generalized set of rules for alphabetical subject headings in 1876 (Cutter, 1876).

Although cataloguing and classification are much easier to rationalize as parts of bibliotaxonomy, this rationalization is not quite as straightforward in the case of indexing. The major snag in this respect, is the fact that there exist libraries where indexing (and its sibling

'abstracting') is, sometimes, executed in other units/sections of the library, especially, the serials department. This would seem to contradict the position that bibliotaxonomy encapsulates the core organizational activities in the technical services department. However, indexing is an integral part of bibliotaxonomy. The simple justification for this categorization resides in the fact that indexing entails the thorough x-ray of the document in order to identify the major words, terms or concepts that can serve as its descriptors (headings, search terms, etc). There have been evidences of indexing as an information organization-cum-retrieval activity even in the days of the cuneiform-document in the Mesopotamian Valley. Although the exact date of this landmark event remains lost in time, the practice of indexing was obvious as it has been reported that some of the earliest cuneiform tablets excavated in Sumeria bore guides to their contents (Nnadozie, 2010 p. 18). These guides, when clarified and contextualized, are the equivalent of modern-day indexes. Indexing practices have gone through several stages of metamorphoses, just as indexes have served various purposes as lists, bibliographies, tables, inventories, catalogues, summaries and registers. This was the case until Andre Crestadoro's suggestion in 1856 that a cataloguer should provide a standard guide to the subject content of a book was concretized by Charlse A. Cutter in 1876. Later theorists and commentators merely refined and expanded the original ideas of indexing as expounded by Crestadoro and Cutter. Hence, a document indexed is a document processed for easy access and retrieval (Nnadozie, 2010). The scale tilts more towards the philosophy behind the categorization. Furthermore, the addition of indexing as a bibliotaxonomic chore emphasizes the action itself and what is intended to be achieved. It, therefore, has little or nothing to do with where the assignment is executed.

This effort at mapping the universe of bibliotaxonomy would be incomplete if there is no mention of accessioning. For a start, accessioning is, actually, among the initial routines at the onset of book processing within the library. It is not really part of acquisitions activities though it is not unusual to accession books in the acquisitions department of most libraries. The domiciliation of accessions work in the acquisitions department is, largely, a matter of convenience. Interestingly, this has gradually evolved into a convention. This practice is not even universal as there are libraries where books are accessioned, catalogued and classified in a rather omnibus processing department/division. But, whatever the accessioning arrangement, the underlying considerations should be the nature of the work and the target or expected result. A library can only assign accession numbers to books and documents that belong to it. In addition to confirmation of ownership, accessioning does much more work of a technical nature. This is in the area of identification - which aids retrieval. When a book is accessioned, it signifies availability since the library only accessions its own documents. Besides, two books cannot have identical accessions numbers. These numbers given to books in the order of their arrival in the library and are therefore unique identification tags. This is where accessioning becomes a classificatory and retrieval tool which confirms its place within the family of bibliotaxonomy.

The adept reader, especially, practicing librarians and other LIS scholars, would have observed that certain elements of technical services have been excised from the map of bibliotaxonomy. A case in point is acquisition or collection development. This is akin to

revisionism as it clearly contradicts the earlier submission to the effect that technical services includes "those tasks associated with bringing materials into the library ..." (Evans, et al, 2005 p. 3). Though there could be other academic disputations regarding the exclusion of acquisition from bibliotaxonomy, the justification is simple: taxonomy covers the naming, identification, characterization and organization of what is already available. It does not bother about the procurement of these things. Bibliotaxonomy, therefore, closely mirrors the original meaning of its root word (taxonomy). Hence, it concentrates on those technical processes associated with identification, classification and organization of information materials (books, documents and other records) that the library has already procured. Acquisition (purchase, procurement or other terms that aggregate to collection development) precedes classification and organization. As such, it is clearly outside the contemplation of bibliotaxonomy.

Another area that might contest for inclusion or admission into the canopy of bibliotaxonomy is shelving/shelf-reading. It will not be surprising if this exclusion stirs the academic hornets' nest! The arguments that may arise is welcome as the discourse would surely have been enriched and deepened. This would further advertize bibliotaxonomy and broaden its vistas. However, although shelving and shelve-reading are part of the means through which the library organizes its collection, the management or supervision of these activities reside within the jurisdiction of readers' services (Evans, Amodeo & Carter, 2005). Besides, shelf administration is a post-processing activity. Materials are only shelved, reshelved and shelve-read after they have been processed. Moreover, the call number which is the backbone of shelving and shelf-reading is assigned during cataloguing and classification. Shelf work is, therefore, a beneficiary of an efficient technical service. Since shelving and shelve-reading are post-processing routines, they cannot therefore be numbered among the bibliotaxonomic chores.

Hence, some activities like abstracting, shelving, shelf-reading and acquisition are outside the jurisdiction of bibliotaxonomy as presently conceptualized and applied in LIS research. This is because, *stricto sensu*, these library routines do not fall within the purview of processing and organization of documentary materials notwithstanding that some like acquisition and accessioning are carried out in the technical services department.

Application of Taxonomic Principles

The principle of taxonomy has been applied in different areas of organization of recorded knowledge in various bibliographical institutions (libraries, archives and other document repositories) over the years. This can be noticed in the fact that books are arranged according to their likeness or similarities. The similarities are in terms of colour, size, authorship, date and subject. This is reminiscent of differentiation or characterization in taxonomic practice. Besides, as noted by Wiley (2007), the principles embedded in Linnaean hierarchy and, subsequently, taxonomic revision entail that each group of organisms (animals or plants) is given a unique name with which it is then categorically ranked (identified). This has made it possible for botanists to rank plants and animals hierarchically, starting from the broad domain and down to the specific specie. Not only does this make for easy identification, it has provided the pathway

for further detailed scholarly investigations in various disciplines and professions. In LIS, for instance, application of taxonomic ideas can deepen and enrich the study and practice of document and knowledge organization (bibliotaxonomy), especially, in respect of cataloguing, classification and indexing. This will help widen the study of hierarchical classification of books, documents, audio-visuals and other information materials in accordance with their matching domains, kingdoms, divisions, class, order, family, genus and species.

Due to advances in publishing technologies, it is difficult to hazard a guess as to the exact population or number of published books and other reading materials, either in the world or within a given national geographical space. It may, however, be safe to say it numbers in hundreds of millions. Each of these titles that make it into the library requires to be classified (identified or characterized) and assigned appropriate identification tags (names, class numbers, etc) for easy shelving and retrieval. To accomplish this task, the librarian will have to rely on the taxonomic principle of naming of things according to their characteristics and placing them in groups. "Name" here is used in the context of heading, index term, descriptor or search term which could represent any of author, title or subject. The librarian must not only correctly discern the content (subject-matter) of each document, this information must be correctly transcribed during document processing. The choice of descriptor is a function of classification which is, actually, a taxonomic activity. Care is also taken to ensure that language of the document as transcribed correctly captures the language of the user. Any mistake made complicates communication and undermines the speed at which information is accessed, retrieved and disseminated in the library.

Of course, it is only when things (plants, animals, species, books, etc) are identified and appropriately named that they can now be fitted into groups with similar attributes, qualities and characteristics. This taxonomic exercise finds expression in the practice of classification and arrangement of books in librarianship. It is also the underlying reason behind indexing. Books and documents are carefully analyzed after which those that addresses the same topics are classed under the same subject. It is not enough for the library to provide a key or guide to available titles, the reader (or information seeker) needs to be equipped to know quickly whether the documents retrieved matches the actual research interest. Hence, in addition to descriptive cataloguing, librarianship goes a notch higher to subject cataloguing - which is what classification really means. In document classification, therefore, another major goal of taxonomy is accomplished and that is "organization of species into larger groups" (Wiley, 2007 p. 183). This taxonomic principle is also applied in the creation of classification schemes where topics, subjects and disciplines are given unique notational symbols or call number (class mark, class number and cutter number), as well as the development of hierarchical classifications and ranking.

The knowledge of taxonomy is also applicable in the reclassification of books and other documents in the library. When books are wrongly classified, the tasks of tracing, retrieving and circulating them becomes laden with strictures and encumbrances. This requires reclassification in line with the hierarchical, evolutionary or historical relationship of the content. Book

classification now progresses from general or broad subject to specific topics. An example of hierarchical progression from broad to specific could be Information sciences, Library science, Bibliotaxonomy, Cataloguing and finally Subject cataloguing (Information science is the broad subject while Subject cataloguing is the specific topic). Another example could be Sciences, Life sciences, Biology, Zoology, Mammals, Humans, Blacks, Africans, Nigerians and Igbo. The philosophy behind this practice is captured in Charles Darwin's assertion that taxonomies should be whenever possible, based on common ancestry relationships (Darwin, *Origin of Species*, 1859). Taxonomists recognize that things share a common ancestry which predicts and explains aspects of both similarity and difference (Wiley, 2007 and Chase & Fray, 2007). In the same vein, reclassification of books corrects the mistakes made in the earlier exercise thereby making the library much more responsive in meeting the information needs of its patrons. It is clear that various principles of taxonomic practice has found expression in librarianship in several ways. However, these taxonomic ideas were not delineated, clarified and properly addressed to depict their taxonomic roots. Through bibliotaxonomy, the searchlight would be beamed more intensely on these taxonomic practices in the library's efforts at organizing its records.

Implications for LIS Scholarship

Adoption of bibliotaxonomy as the preferred name for the study of areas of LIS concerned with the organization of records and knowledge has several implications for education and research. The ripple effect would reverberate across many disciplinary boundaries and communities of scholars. In the first place, it sounds and elicit the imagery of academicism which makes it a fitting alternative for either of the rather lengthy troika of "cataloguing, classification and indexing" or the imprecise duo of "technical services" and "organization of knowledge" presently in use. Adoption of bibliotaxonomy enables LIS to communicate its technical processes in the accepted scholarly language. By using this academically-recognizable nomenclature, the practice of taxonomy in librarianship would also be brought to the attention of professionals in other disciplines, thereby establishing a veritable avenue for inter-disciplinary research collaborations. In addition to setting the stage for the delineation of other areas of specialization in LIS, the introduction of bibliotaxonomy will trigger a paradigm shift in the perception of the internal workings and technical processes of libraries, as well as the taxonomic principles in librarianship. There are several reasons to believe that bibliotaxonomy is a veritable game changer. This much can be inferred from the clarifications that ensue in the succeeding paragraphs:

The volume of published materials has grown into hundreds of millions. Those that eventually make it to the library should be organized in ways that facilitate easy identification, retrieval, dissemination and utilization. These documents should be processed such that the contents (subjects) are easily captured in the catalogue or other retrieval tools. Bibliotaxonomy not only expands the skills for correct classification of library documents, it ensures that subjects assigned fit titles in appropriate disciplines and the users' search pattern. In this way, bibliotaxonomy helps track publications and their disciplinary spread within the library. In

addition to this obvious implication for LIS scholarship, clarification of taxonomic practices in librarianship has far-reaching academic and international consequences as each nation strives to identify, enumerate and preserve its publishing outputs on areas unique to it.

It is possible that more taxonomic ideas can be borrowed and applied to deepen and enrich the study of library technical services or organization of knowledge, especially, cataloguing and classification. For example, mastery and application of the principles of binomial nomenclature (introduced by Carl Linnaeus, the Swedish botanist) could spur librarians to develop an alternative consistent method of naming (classifying) disciplines in the library collection. This will assist in fashioning appropriate names and notational symbol (class mark, class number and cutter number) for any emergent disciplines and topics that are not captured in existing classification schemes. Each idea that gains academic currency and social acceptance would be easily identified with a unique taxon while the categories are placed in a ranked hierarchy relative to other categories. As with plant and animal taxonomies, bibliotaxonomy will develop categorical ranks of documents showing the domain, kingdom, division, class, order, family, genus and specie. This will expand and enrich the study of organization of knowledge.

With the introduction and acceptance of bibliotaxonomy, there is bound to be constant dialogue between taxonomists in LIS (i.e. bibliotaxonomists) and their colleagues in other disciplines (especially, medicine, botany, pharmacy, zoology, etc) regarding what constitutes the most general kind of classification. Expectedly, there would be advocates and critics. As such, there is bound to be as much agreements as there would be disputations. However, the anticipated intense debates, both in the literature and at various intellectual fora (conferences, seminars, workshops, symposia, etc) would advertize the concept of bibliotaxonomy and, in so doing, engineer a global movement in support of the philosophical underpinning of this phenomenon.

Available literature has not shown any academic collaboration between classical taxonomists and librarians. With the introduction of bibliotaxonomy, this will most likely change in the nearest future as the attention of other taxonomists would be drawn to the practice of this art in librarianship and possible areas of research collaborations. This envisaged interdisciplinary co-operation in research and publication will further expose the LIS scholar to the extent of the predictive power of taxonomy. The LIS researcher will go beyond the periphery to investigate and appreciate the ability of modern classification to predict and explain aspects of both similarity and difference in a manner that is superior to the old-style classification (Wiley, 2007). The result would be a flowering of opinions and literature of bibliotaxonomy as pundit jostle to canvass their views in the market place of ideas.

As has been the case with practitioners of other genres of taxonomy, particularly plant and animal taxonomy, bibliotaxonomists through consistent research and experimentations, could eventually create a universal code of naming subjects and assigning them notational symbols. International collaborations would lead to use of nomenclatures that transcend institutional, national and linguistic boundaries. This would eliminate the confusion that

normally arises when different names are applied to the same documents or subjects by different cataloguers, classifiers or indexers.

One major implication of the adoption of bibliotaxonomy is that those aspects of LIS study that come under its ambit now has a recognizable academic nomenclature. This would engender more rigorous researches and a further flowering of literature as each scholar strives to report the latest findings and contributions to the deepening of this field of study. The resultant healthy rivalry would produce more focused academic papers. Hence, at the mention of bibliotaxonomy, members of the academia easily situate the area of specialization.

With the emergence of bibliotaxonomy, the stage would have been set for more interrogation and restructuring of the LIS disciplinary landscape. It is anticipated that this self-scrutiny would lead to the partitioning of the rest of LIS into definite research areas and specialties like collection development, library management/administration, library history, applied librarianship, information user psychology, etc. There is no harm, for instance, if the present work inspires another LIS researcher to explore and develop the concept of *biblioepidemiology* (coined and used here as study of the spread, circulation and distribution of books, information and knowledge). This means LIS scholars and practitioners would be identified and addressed by their areas of competence. The aftermath would be a correction of the present scenario in which people are addressed as Professors of Library and Information Science (LIS). This is anomalous because, the accepted conventional practice is to specialize and profess in a smaller or narrower aspect of a discipline. Hence, through the anticipated clearer delineation of research areas in LIS, there will now be Professors of Bibliotaxonomy, Biblioepidemiology or Bibliometrics, etc in the Department of Library and Information Science (LIS).

Conclusion and Recommendations

There is need for continuous interrogation of the boundaries of librarianship and LIS scholarship. This would lead to clarification of existing concepts, creation of new paradigms and generation of ideas to address identified problem areas. It is in the light of this reasoning that bibliotaxonomy was coined to address a felt need in LIS education, research and practice. Its enters the LIS lexicon as a response to the desire to delineate, deepen and rebrand the study of organization of knowledge in libraries, archives and other information centers. The concept of bibliotaxonomy is designed to serve as a preferred generic academic nomenclature for the technical processes of cataloguing, classification, indexing and accessioning. Sustained research and intellectual reinterpretation of classical library technical services in the light of its current impreciseness will lead to clearer demarcation of the scope of its organizational aspects (i.e. bibliotaxonomy). This is in addition to better application of taxonomic ideas in the study and practice of document description and organization. The implication would be a flowering of publications on bibliotaxonomy, creation of other areas of specialization in LIS education, as well as interdisciplinary collaborations between librarians and taxonomists in other professions. The result would be greater societal recognition for bibliotaxonomists and their contributions to

the dissemination of information and knowledge. It is on the basis of the foregoing that the following recommendations are made:

There is need for more constructive investigation of the concept of bibliotaxonomy. This will help clarify the concept, deepen its definition for universal acceptance, and delineate its components as a field of study. As a corollary, LIS scholars and practitioners are encouraged to ensure regular use of the term "bibliotaxonomy" in their research reports and other academic publications.

Bibliotaxonomy should be accepted as an area of academic specialization for LIS scholars. If that is done, the stage would have been set for other LIS practitioners to identify, carve out and clarify other areas of academic specialization and professional practice within the wider LIS profession.

More funds should be budgeted for bibliotaxonomic researches. Such monies will help finance investigations into different areas of bibliotaxonomy, organize academic fora, publication of research findings and dissemination of the results. In that way, the society will gain more knowledge and understanding of the ramifications of the phenomenon.

LIS scholars and professionals must initiate collaborative researches and publications with taxonomists in other fields and disciplines. This will lead to cross fertilization of ideas and increase interdisciplinary understanding. The multiplier effect of such co-operative research projects will definitely enrich scholarship, across board.

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