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Debabrata Maity
maitydebabrata6@gmail.com

Bidyarthi Dutta
bidyarthi.bhaswati@gmail.com

Why LIS is Interdisciplinary in Nature? Finding Root from a Fundamental Base of the Subject

Debabrata Maity[1] and Bidyarthi Dutta[2]

[1]Librarian, Khejuri College, Baratala, Khejuri, Purba Medinipur, E-mail:
maitydebabrata6@gmail.com

[2]Assistant Professor, Department of Library and Information Science, Vidyasagar University, Midnapore, West Bengal, E-mail: Bidyarthi.bhaswati@gmail.com

Abstract: Library and information science (LIS) is evolved due to the merging and integration of two separate fields *i.e.,* library science and information science. Interdisciplinary nature of LIS according to the identification of some scholars has been highlighted and also meaning and characteristics of interdisciplinary study has been pointed out here shortly. Brief descriptions have been made about the concept of category or category analysis—a vital fundamental base of LIS field and interdisciplinary nature of the field has been interpreted here with the inherent interdisciplinary nature of category.

Keyword: Library science, Information science, Library and information science, Category, Interdisciplinary study, LIS and interdisciplinary study

Introduction:

The first ever library school was started at Columbia College (now Columbia University) in USA by Melvil Dewey in the year 1887. India was a little far behind. Almost two and half decades later first training programme for library workers was started by W. A. Borden, a disciple of Dewey, at Central Library in Baroda in 1911. LIS evolved by the integration of two separate fields *i.e.*, library science and information science. Library science deals with processing and organization of documents in libraries, where as collection and processing of consolidated information from various subject domains is the main scope of information science. According to Dutta & Dutta (2013), due to the proper retrieval of any document from a total collection, segregation of each document on the basis of its subject content is much necessary. So subject determination of document is a core area of study of both library science and information science. According to them (p. 79):

It is hardly possible to trace out a distinguished instant at which these two separate streams viz. library science and information science were riveted together and introduced as library and information science... the concept of subject and its classification is an imperative core area of study of both library science, information science and at the same time library and information science also.

LIS field is well known due to its distinct names through the whole world and due to the times need same department have come to known with some changes in its name. According to a study by Prebor (as cited in Prebor, 2010, pp. 2-3):

... the dissertations classified in ProQuest Digital Dissertations under the topics 'Library Science' or 'Information Science' were actually conducted in information studies departments, which, because of the high-paced changes in the field, are variously called 'School of Information and Library Science', 'School of Information Science', 'Department of Information Science and Telecommunication', 'School of Library and Information Science', 'College of Communications and Information Studies', 'College of information and Information Studies'.

LIS is evolved by the contribution from many disciplines including science, social science, arts and humanities. Its interdisciplinary nature has been discussed by many experts through their research contributions. Concept of category or category analysis is one of the core fundamental bases of LIS field. Present study discusses the interdisciplinary nature of LIS field through the concept of category.

Objective:

The main objective of present study is to interpreting the interdisciplinary nature of LIS field through the analysis of the inherent characteristic of category.

Methodology:

Literature review has been done regarding the interdisciplinary nature of LIS field. Characteristics of interdisciplinary field have been identified. Concept of category as given by some eminent scholars has been demarcated. Interdisciplinary nature as an inherent characteristic of category has been identified and interpretations about the interdisciplinary nature of LIS have been made with the same.

Literature Review:

Interdisciplinary character of LIS has been analysed and discussed by many eminent scholars since few decades before. Saracevic (1999, p. 1052) viewed that "Information Science is

interdisciplinary in nature". He alerts about the danger of splitting the field into two separate domains—information science which is researching about technological systems and mainly practised by computer professionals, and information science which focuses on the information user. He viewed that both areas should be covered by a single field. Buttlar (1999) analysed 61 LIS doctoral theses conducted in the year 1994-7 and noticed that almost half of the citations are taken from the LIS field itself. Except LIS, citations are taken from some other notable fields like education (11.45%), computer science (5.72%), sociology (3.79%), medicine/health and so on. Buttlar came into conclusion that LIS is definitely an interdisciplinary field and it is closely related to some other fields like education, computer science, health/medicine, psychology, communication and business. Tang (2004) used the term "Information and Library Science" (ILS) in place of "Library and Information Science" (LIS) in a study named as *Evolution of the Interdisciplinary Characteristics of Information and Library Science*." Tang empirically investigated citations to 150 journal articles in the field of ILS with the publication year of 1975, 1980, 1985, 1990, 1995 and 2000. Science Citation Index, Social Science Citation Index and Arts and Humanities Citation Index were searched and data was recorded with the limitation to the journal articles only. A number of 25 ILS articles were randomly selected from each six years and citation frequency of the cited document and subject category distribution—both for self-citations and extra-disciplinary citations (i.e., citation coming except from the discipline of the cited document) of the citing documents were noted. Comparing with Buttlar's (1999) original data Tang constructed a comparative table to show the disciplines citing and cited by ILS. According to this study Computer Science, Education, Communication, Business, Mathematics, Health/Medicine and political Science are some major discipline that citing ILS documents, whereas Buttlar shows Education, computer Science, Health/Medicine, Sociology, Psychology are some of the major disciplines cited by ILS. Impact of Computer Science to the ILS discipline and the correlation between the same is gradually growing since the year 1990. Odell and Gabbard (2008) conducted a study by using citation data from "*Journal Citation Reports (JCR)"* for the period 1996-2004, that replicates analysis of other-field citations to LIS journals from 1972-1994, by Meyer and Spencer (1996). From their study it is clear "that the fields most likely to cite LIS literature from 1972 to 1994 have continued to cite LIS journals more than most disciplines do." Two subjects i.e., Computer Science (from 15.5% to 34.9%) and Business & Management (from 8.0% to 15.0%) have doubled their citations to LIS field. Fields like Medicine (9.4%), Psychology (4.1%) and Engineering (4.6%) are continued to provide more citations to LIS journals than most Science and Social Science field.

Prebor (2007; 2010) conducted almost two parallel studies to analyse interdisciplinary nature of LIS. Both studies were conducted with master's theses and doctoral dissertations as tagged on the ProQuest Digital Dissertations database under either or both "Library Science" or "Information

Science" for the period 2002-06. But first study was conducted with that one third of the total documents which are the product of LIS departments and second study was with the remaining two third documents, conducted in non-LIS departments. After completing second study Prebor concluded that there are clear distinctions in the research topics between the studies conducted in various information studies departments and the studied conducted in non-information studies/non-LIS departments that are involved in studying information. Keeping relation to the core issues (Data Organization and Retrieval, Methodology, Foundation of Information Science) of LIS field, while LIS scholars focus on information user, his/her method of tracking down information, information needs and the impact of information on the individual and his/her environment, but scholars from other fields like Business Administration, Computer Science, Education and Communication and etc., focus on information technology, information industry and the management of information and knowledge. Topics on Information/Learning Society, Information Ethics and Law are equally studied by both LIS and non-LIS field. Sugimoto, Ni, Russel, & Bychowski (2011) used academic genealogy as an indicator of interdisciplinarity and they used academic genealogy network data from 3,038 PhD theses in LIS for a period of eighty years (1930-2000) to reveal interdisciplinary changes in the field. They found that there is a strong history of mentors from education and psychology and mentors with LIS degree have a decreasing trend as opposed to mentors from computer science, business and communication.

What is Interdisciplinary Study?

Knowledge production pattern is changing to more application oriented, day by day we progress. Gibbons et al. (1994) mapped this changing pattern into two modes of knowledge production. Mode 1 deals with the production of traditional "disciplinary science", where more theory based knowledge (physical and human) is produced. In contrast, Mode 2 deals with application-oriented knowledge. Few scholars identified these two types as disciplinary and non-disciplinary knowledge. Non-disciplinary knowledge formed by the integration of different disciplinary approaches, can further be sub-divided into multidisciplinarity, crossdisciplinarity, pluridisciplinarity, interdisciplinarity, and transdisciplinarity on the basis of integration level. As per the objectives of the present study here discussion have made only about "Interdisciplinarity".

Definition:

Two popular dictionaries i.e., *Oxford Advanced Learner's Dictionary of Current English* and *Random House Unabridged Dictionary* (as cited in Choi & Pak, 2006, p. 353) provide meaning of "Interdisciplinary" as "Of more than one branch of learning, e.g. interdisciplinary studies/degrees" and "Combining or involving two or more academic disciplines or fields of study; or two or more

professions, technologies, departments, or the like, as in business or industry" respectively. Grossman (1979) described it as—Joint, coordinated, and continuously integrated research done by experts with different disciplinary backgrounds, working together and producing joint reports, papers, recommendations, and/or plans, which are so tightly and thoroughly interwoven that the specific contributions of each researcher tend to be obscured by the joint product. According to Flinterman, Teclemariam-Mesbah, Broerse, & Bunders (2001, p. 253), "Interdisciplinary research is a collaboration of several disciplines, but in this case concepts, methodologies, or epistemologies are explicitly exchanged and integrated, resulting in a mutual enrichment."

Features:

Some common features of interdisciplinary subject/work have been traced out here from a study by Choi & Pak (2006).

1. Participants working between several disciplines with shared goals.
2. Participants from different disciplines work jointly with common roles.
3. Though participants are surrendered by some aspects of their own disciplinary role, but have to maintain a discipline-specific base.
4. Integration and synthesis work is done and boundaries of participated disciplines tend to blurring.
5. It is interactive, integrative, collaborative and graphically analogous to two partially overlapping circles.
6. Participants learn about and from each other through internal coherence; shared common methodologies.
7. Impact is more than the sum of the individual participants' part, having two types of impact—creation of new knowledge or perspective and of new disciplines.

Concept of Category:

Wildhack (as cited in de Grolier, 1962, p.15) considered a category as a synonym of "point of view," by which a subject can be divided. *Harrod's Librarians' Glossary...* (Prytherch, 2005, p. 116) defines it as "A concept of high generality and wide application which can be used to group other concepts." Ranganathan used the term "Category" in a specialised sense. According to him, a subject can be divided by a single train of characteristics into different groups, such a whole group (or each group) of divisions or foci is termed as facet and each division of a facet is said to be an Isolate focus, or simply an Isolate. To him "each facet of any subject, as well as each division of a

facet, is considered as a manifestation of one and only one of the five fundamental categories—Time, Space, Energy, Matter and Personality" (as cited in Dhyani, 1998, p. 124). The term "Fundamental category" was used by him and opined that "There are five and only five fundamental categories—viz., Time, Space, Energy, Matter and Personality" (Ranganathan, 1967, p. 399). D J Foskett (as cited in Dhyani, 1998, p. 124) "equates the term 'Category' with the term facet and states that 'facet analysis' consists in an analysis of a subject in its entirety 'into a certain number of facets or categories of things; within each category, the subject headings enumerated all possess the same relationship *vis-a-vis* the subject in its entirety.'"

Cutter (1876) in his book "*Rules for a Dictionary Catalogue*" provided some principles on syntax and semantics for subject indexing, but any categorical concept to represent the facets of a subject statement is not found in his work. Though the concept of categories is as old as Aristotle, who used the term category to denote ten classes of "being" and later his concept was revised by Immanuel Kant, but here in table below only few persons are listed, as fallen within the period (1911-2009) of J. O. Kaiser to B. K. Sen era (Kumar, 1988; Dhyani, 1998; Sen, 2009). Pandey (1996) made a detailed comparison of categories as given by different scholars.

Table-1: Categories

SN	Name	Work (Year)*	Categories (Written as per citation order, except SN 7)		Comparison with Ranganathan's PMEST
1	J. O. Kaiser	Systematic Indexing (1911)	1. Concrete	i. Movable	Personality
				ii. Immovable	
				iii. Abstract	
			2. Process		Matter Method
2	S. R. Ranga-nathan	Colon Classifica-tion (1933)	1. Personality (P)		—
			2. Matter (M)	i. Material	—
				ii. Property	
				iii. Method	
			3. Energy (E)		—
			4. Space (S)		—
			5. Time (T)		—
			1. Organisms and Service (Origin, or Subject, of Documents) (Nature; Places)		Personality

3	Gerard Cordo-nnier	(1943)	2. Person (Miscellaneous Categories)	Personality
			3. Individuals (living beings); Biological Conditions	Personality; Matter Property
			4. Bodies (Natural; Simple; Compound) (Miscellaneous Condition)	Personality (Matter Property)
			5. Miscellaneous Equipments (Property, Fittings)	Matter Mathod
			6. Miscellaneous Action (Physical; Technical; Economic)	Energy
			7. Intellectual Concepts	Personality
			8. Documentary Forms	Personality
			9. Time	Time
4	D. J. Foskett**	(1955)	1. Products	Personality
			2. Parts	Personality
			3. Materials	Matter Material
			4. Operations	Energy
			5. Miscellaneous Common Subdivisions	—
5	B. C. Vickery***	Classifica-tion and Indexing in Science (1958)	1. P : Substance, Product, Organism	Personality
			2. O : Part, Organ, Structure	Personality
			3. C : Constituent	Matter Material
			4. Q : Property and Measure	Matter Property
			5. R : Object of Action, Raw Material	Matter Material
			6. E : Action, Operation, Process, Behaviour	Energy, Matter Method, Matter Property
			7. A : Agent, Tool	Personality
			8. G : General Property, Process, Operation	Matter Property, Matter Method, Energy
			9. S,T : Space and Time	Space, Time
6	G. Bhattac-haryya	(1981)	1. Discipline	Personality
			2. Entity	Personality
			3. Property	Matter Property
			4. Action	Energy
7	Hindu Philoso-phy as highlig-hted by B. K. Sen	Universe of knowledge from a new angle (2009)	1. *Kshiti*	Personality, Matter
			2. *Ap*	Personality, Matter
			3. *Tejas*	Energy
			4. *Marut*	Personality, Matter
			5. *Vyoman*	Space
			6. *Srishti*	Time
			7. *Sthiti*	Time
			8. *Laya*	Time

* Some of the above mentioned scholars have developed category through several sequential editions/publications. Year of first edition/publication is mentioned here.

** Foskett developed three faceted special classification scheme— *Metal Box Company's Classification* (based on six categories), *Food Technology* (based on four categories) and *Health and Occupation Safety* (based on sixteen divisions). "To Foskett, these can be reduced to five facets—Products, Parts, Materials, Operations and Miscellaneous Common Subdivisions" (Dhyani, 1998, p. 130).

*** Comparing to Ranganathan, "Action" (under "E"), "Operation" (under "E") and "General Operation" (under "G") are similar to "Energy"; "Process" (under "E") and "General Process" (under "G") are similar to "Matter Method"; "Behaviour" (under "E") and "General Property" (under "G") are similar to "Matter Property".

Analysis and Discussions:

In library classification we deals with documents and our aim is to arrange the documents in a systematic and helpful order. We arrange the documents by its subject content. It is impossible to count the total number of documents exist at present in the world and also in future. There are no limitations in the number of documents and the subjects contained in this infinite number of documents actually in total form universe of subjects. So in library classification we try to provide a systematic and helpful order to the universe of subjects. Subject of a document can be expressed by its subject statement. Subject statement can be obtained or formed by analysing the title or the contents of the document. For providing systematic arrangement to any subject statement, it is necessary to analysis categories or facets included in the subject statement.

From the Table-1 it is found that the number of categories and their nature varies from person to person and from past to present. Even to one person, it varies from subject to subject, clearly viewed in science subjects. As for example, D. J. Foskett developed separate categories both in number and in nature for his three separate faceted classification schemes (already mentioned in the footnote under Table-1). B. C. Vickery also used distinct categories for his several special classification schemes, among which three may be highlighted—eight categories for the scheme "Soil and Earth Sciences", nine categories for the scheme "Astronomy" and ten categories[1] for the "Reactors"; he also provided nine categories (as mentioned in the table), "which may be applicable in general to all the disciplines" (Pandey, 1996, p. 144). According to him "A list of fundamental categories should not be used mechanically and imposed upon the subject, but it should be used as provisional guide in approaching a new field" (Vickery, 1960, p. 25).

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[1] Ten categories for "Astronomy" and nine categories for "Reactor" (Dhyani, 1998, p. 131)

As categories varies from subject to subject, so it can be said that for making any special classification scheme for a particular subject, knowledge of that concerned subject along with the knowledge of LIS is necessary. For construction of any general classification scheme also collection, synthesis and integration of knowledge or concepts of universe of subjects along with the knowledge of LIS field are much needed. To construct any scheme (special or general) LIS professionals must have to work together with subject experts from distinct subject fields by sharing knowledge and keeping common goals, otherwise identification and arrangement of several divisions and subdivisions (isolates, foci) under categories/facets is not possible properly. So, category/facet identification itself is interdisciplinary in nature. In other words interdisciplinary feature is an inherent characteristic of category, which reveals the interdisciplinary nature of LIS.

Conclusion:

As more as our world progress to the knowledge society, it becomes more interconnected and interdependent. Information is becoming a vital and determinative aspect of life. Bates (1999) has defined the zone of information science studies as a meta-field, which is almost similar to other information-based professions such as education and journalism/ communication, though differences exist in methodologies and required skills. Larivière, Sugimoto & Cronin (2010, p. 997) have found two major shifts of LIS, "In 1960, LIS changed from a professional field focused on librarianship to an academic field focused on information and use; and in 1990 LIS began to receive a growing number of citations from outside the field, notably from Computer Science and Management." According to them, "The vast quantity of information produced needs to be managed, and its production, storage, and dissemination is done with computers... LIS has come of age and is now attracting attention from its academic near neighbors" (p. 1013). Though LIS field has its own zone but due to the needs of performance evolution of its different branches and/or sub-branches we must have to use different tools from different subject fields. As for example, in case of user study we need help from psychology, cognitive science, and statistics; for automation and its related work we need help from computer science, statistics; for making information retrieval systems and in house databases we need basic knowledge of linguistics for making subject index entries and of computer science etc. All the discussions about LIS field have been made here and above are very much related to the interdisciplinary concept of Besselaar & Heimeriks (2001, p. 706), "An interdisciplinary approach, on the other hand, creates its own theoretical, conceptual and methodological identity. Consequently, the results of an interdisciplinary study of a certain problem are more coherent and integrated." So LIS field is obviously interdisciplinary in nature.

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