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An Interdisciplinary Encounter Between Two Knowledge Domains: Library and Information Science vs Knowledge Management

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Abstract
The main purpose of this study is to develop a framework of the interdisciplinary encounter between two knowledge domains. The study adopted a case analysis of library and information science's (LIS) encounter with knowledge management (KM). It examines the views of LIS academics and practitioners regarding their awareness of KM concepts, their responses to KM, factors influencing them to respond to KM, and issues related to the incorporation of KM into LIS. LIS has incorporated the core content of KM based on the combination of varying proportions of major perspectives and skill-sets of KM. It follows a partial adoption process through mutual borrowing of knowledge between LIS and KM. The findings suggest that LIS has encountered KM through recognizing KM, responding to it, and renovating the existing structure of LIS. Thus, the paper proposes a 3R model of the interdisciplinary encounter between two knowledge domains, where 'R' stands for *Recognizing, Responding* and *Renovating*. The model is original in nature broadening its scope from LIS and KM to the generalization of other disciplines. Finally, the paper provides some suggestions for the better integration of KM education and practice in LIS.
Keywords: Interdisciplinary encounter, Knowledge domain, Knowledge management, Library and information science

1. Introduction

The concept of interdisciplinary has been discussed by many researchers and can be defined as scientific output or activity using knowledge, methods, and tools from two or more disciplines (Huutoniemi *et al*, 2010; Klein, 1996; Rosenfield, 1992). An "interdisciplinary work" integrates knowledge and modes of thinking from two or more disciplines (Mansilla and Gardner, 2005). Interdisciplinary activity is the transfer and integration of concepts, theories, methods or practices from one discipline to another. With the continuous development and progress of science and technology, related disciplines have shown a trend which is both highly differentiated and highly integrated (Xu *et al*, 2016).

Library and information science (LIS) as we know today, is the integration of two knowledge domains, i.e. library science and information science. The discipline of library science was formally introduced at Columbia University in 1887 (Wilson & Hermanson, 1998). Library science concentrates on the theory and fundamental principles of librarianship (Landridge, 1978), and its intellectual foundations contain the selection, organization, planning, and management of library resources; guidance in their use; and historical, philosophical, and legal aspects (Carnovsky, 1964). During the 1960s and the early 1970s, library science embraced the new discipline of information science. Information science as defined by Borko (1968) is concerned with that body of knowledge relating to the origination, collection, organization, storage, retrieval, interpretation, transmission, transformation, and utilization of information. It is an interdisciplinary science derived from and related to such fields as mathematics, logic, linguistics, psychology, computer technology, operations research, the graphic arts, communications, library science, management, and other similar fields.

In response to the emergence and impact of information science, the discipline of library science has incorporated many aspects of information science into its education and professional practice. Hayes (1994) mentions that "together librarianship and information science share common concerns with each of them, but they approach them from different perspectives and with different priorities." Library science's encounter with information science results the integration of both the disciplines addressing the issues related to information. As a result, library and information science (LIS) has gradually become recognized as a single discipline, and the scope of LIS has been broadened ever since (Huang and Chang, 2012). LIS encompasses all aspects of information management and library operations. The American Library Association Committee on Accreditation (1992) defines LIS as a discipline concerned with "recordable information and knowledge and the services and technologies to facilitate their management and use, encompassing information and knowledge creation, communication, identification, selection, acquisition, organization and description, storage and retrieval, preservation, analysis, interpretation, evaluation, synthesis, dissemination, and management". This illustrates the strong inter- and/or multidisciplinary nature of LIS which is supported by Prebor (2010). Chang and Huang

(2012) examined the characteristics of and changes in LIS interdisciplinarity and found a stronger relationship with the disciplines of general sciences, computer science, business/management, education, and sociology.

The discipline of LIS again embraced the rapidly growing field of knowledge management (KM) that has attracted much attention from a number of disciplines during the 1990s. The Gartner Group (1997) defines KM as "a discipline that promotes an integrated approach to the creation, capture, organization, access, and use of an enterprise's information assets. These assets include structured databases, textual information such as policy and procedure documents, and most importantly, the tacit knowledge and expertise resident in the heads of individual employees." It is multidisciplinary, and hence, its discourses have occurred within academic programs of a number of disciplines including business and management, computing, library and information science, human resources management, etc. Being interdisciplinary and/or multidisciplinary in nature, KM education programs significantly vary in structure, and have a range of diversified course contents and curriculum areas emphasizing on different disciplinary and professional perspectives. The background of this study suggests that LIS is a dynamic field that has adapted to changes time and again in response to the demands of society. The movement of KM into LIS indicates KM's relevance to LIS, and the LIS academics and practitioners have recognized the importance of KM in the field of LIS. Based on the case study of LIS's encounter with KM, this study intends to develop framework of interdisciplinary encounter between two knowledge domains.

2. Objectives of the Study

The increasing interdisciplinary nature of LIS creates the possibility of adopting new but related disciplines. KM is an important innovation of the global knowledge economy. It is an emerging inter/multidisciplinary field that has many faces based on theories, metaphors, and approaches from several disciplines. In the context of incorporating KM into LIS, this study examines the interdisciplinary encounter of LIS with KM. Specifically, the study has the following two-fold objectives:

- Build a framework of the interdisciplinary encounter between two knowledge domains, and
- Suggest measures for the implications of KM education and practice in LIS.

3. Research Methodology

This study is a part of a dissertation project (Roknuzzaman, 2009). It also incorporates the findings of the papers produced from the dissertation (Roknuzzaman and Umemoto, 2009; 2013a; 2013b). The strategy followed in this research is a case study of the encounter of LIS with KM. The methods employed in this study include a literature review, document analysis, a survey of the homepages of LIS schools having KM programs, and e-mail questionnaire survey of LIS academics and practitioners worldwide. A purposive sampling technique was used to select LIS schools, academics, and practitioners. Based on the survey of LIS schools' homepages, an e-mail questionnaire was sent to 106 LIS academics who adopted KM education in their institutions. Another e-mail questionnaire was sent to 20 library practitioners who were experienced in KM. Fifty seven (57) valid questionnaires from LIS academics and 10 from library practitioners were received and analysed in line with the study objectives. The findings followed qualitative approach of research.

4. LIS's Awareness of KM Concept

Both LIS academics and practitioners have recognized KM either from LIS or from other sectors, including corporate, ICT, and human resources. This means that KM has a strong relation to LIS, as well as to other disciplines. Formally, LIS people came to know about KM concepts through different ways. For example, library practitioners became aware of KM concepts through explicit knowing, experiential knowing and knowing from job market (Roknuzzaman and Umemoto, 2009), while LIS academics through explicit, intuitive, experiential and reflective ways of knowing (Roknuzzaman and Umemoto, 2013a). In some cases, they have recognized KM through direct action and experience, observation, and conversation, when addressing LIS education and research in the areas of 'organizational information management', 'management and information-related competencies', 'resources and services of specialized information', and so on. LIS people's different ways of knowing about KM have significantly influenced them to understand KM, and therefore, they have perceived KM from a number of viewpoints which can be categorized as-

- A process or an information management point of view,
- A very broad and a comprehensive viewpoint,
- An inter- and/or a multidisciplinary point of view,
- A technological or systemic point of view,
- A strategic or a business point of view,
- A managerial or an organizational point of view,
- A tacit point of view, and
- A cultural point of view (Roknuzzaman and Umemoto, 2009, 2013a).

5. LIS' Responses to KM

Recognizing the emerging notion of KM, LIS has positively responded to KM despite differences of opinions as to the concept of KM, its relation to LIS, and its future in LIS. LIS academics considered the emerging KM job market as "a window of opportunity" for their graduates. Their responses to the advent of KM concepts are as follows (Roknuzzaman and Umemoto, 2013a):

- KM appears to bring opportunities for LIS graduates to acquire new business skills and to compete in the KM job market,
- The core skills of KM are relevant and essential to LIS, and hence, LIS should respond to KM immediately,
- KM is a domain that is distinct from both LIS and IM, and therefore, LIS professionals need to expand their roles, knowledge and skills in order to work in a KM environment,
- There is a significant overlap between KM and LIS, and some elements of KM can be found in LIS curricula,
- KM can bridge or at least minimize the cultural gap between business world and LIS,
- KM has long roots in LIS, and certainly, it is a job for LIS people, and
- KM is a new term for what LIS professionals have always been doing in the form of managing recorded or explicit knowledge.

A number of factors have influenced LIS in responding to KM; among them, the most important one is the role of the knowledge economy and society that has created emerging job markets for LIS graduates. Other factors include the natural evolution of the information field, the interdisciplinary nature of both LIS and KM, the expansion of the knowledge domain of LIS, the survival issue of LIS, the role of technological innovations and their applications in LIS, increasing demand for KM from students and faculties, etc.

6. LIS's Adoption of KM

Considering the increasing importance of KM, the academic side of LIS has incorporated KM either as separate programs at bachelor, certificate, diploma, and master's degree levels, or as a course integrated into the LIS degree. Since there is no widely accepted and comprehensive definition of KM, LIS academics have incorporated four major perspectives and a range of KM skill sets into individual KM courses or programs differently, considering the subject interest of LIS academics and students, and the mission and vision statements of LIS schools. However, on average, as shown in Figure 1, the information-related perspective has been given priority by LIS, followed by technology, human, and business perspectives.

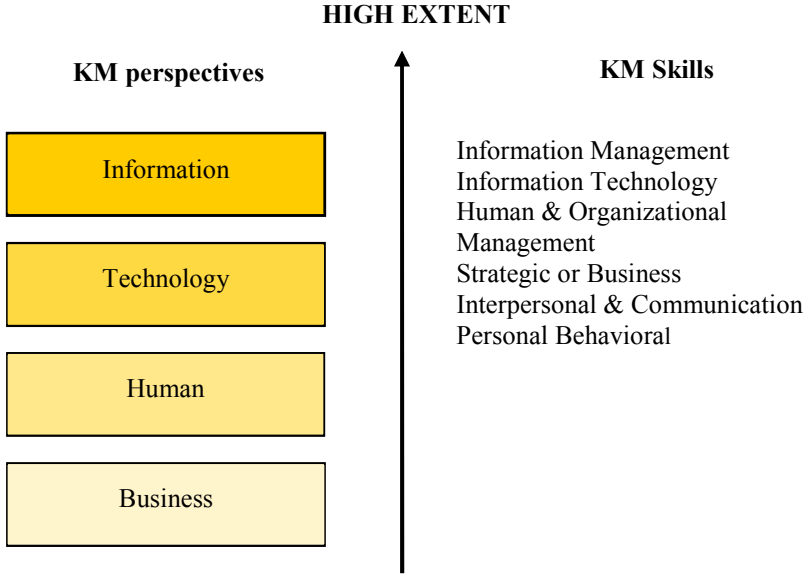


Figure 1: Incorporation of KM perspectives and skill sets in LIS

Both LIS and KM meet in the area of 'organization of knowledge', and LIS academics have developed KM programs or courses based on a mutual knowledge borrowing process. LIS has provided its information or content management elements that address the management of explicit information and/or knowledge in the KM domain. Therefore, a convergence can be seen between the two knowledge domains in the theory and practice of knowledge acquisition, classification, and organization; in processing, storage and retrieval; in system analysis and design; in database management, data mining, portals and information architecture, information networking and transfer; etc. On the other hand, KM is maturing due to the inputs from various disciplines. It is difficult for a particular discipline to adopt the whole contents of KM for developing a single course; even though it is

possible to outline a KM program, it is difficult to teach all of the disciplinary perspectives of KM without any business or management background. Therefore, LIS has borrowed some concepts such as knowledge mapping, business and competitive intelligence, intellectual capital management, KM tools and technologies, KM strategies, organizational learning and behavior, knowledge sharing (tacit dimension), business information, etc. input by other disciplines, but relevant to LIS. Thus, a mutual knowledge borrowing has occurred between the two knowledge domains- LIS and KM, following a partial adoption process (Roknuzzaman and Umemoto, 2013b).

The incorporation is not the end; rather, LIS needs to reorganize or rebuild the field through a process of renovation. Renovating is an ongoing process that facilitates the expansion of the existing knowledge domain of LIS and strengthens interdisciplinarity. The renovation of LIS has taken place through the restructuring of academic programs, core contents, specializations and electives, relationships with other neighboring disciplines, redefining the role and responsibilities of the profession, adjusting or modifying existing names of programs, courses, etc.

7. Encountering between two Knowledge Domains

Guided by the review of literature, and the major research findings, this study has built a theoretical model of an interdisciplinary encounter between two disciplines, considering them as two Knowledge Domains (KD). Petric (1992) noted that disciplinarity is not a static nor sacred concept handed down as dogma, but rather it is chosen and constructed "for some human purpose and can be more or less useful in serving that purpose." In the midst of dynamic changes of society, disciplines are always challenged to be replaced with or integrated into other disciplines. The disciplines, however, often differ in what ways and methods they apply for interaction, and what types of response and relationship are deemed necessary and satisfactory. Although many researchers have argued for the efficacy of interdisciplinary programs, none have provided any precise and widely accepted mechanism for successful integration. The present study tries to minimize the existing gap in the literature, and proposes a 3R model as shown in Figure 2.

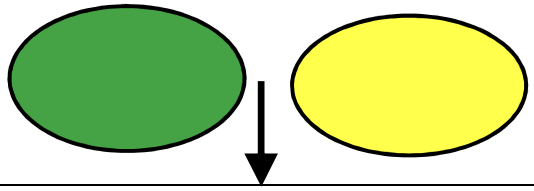
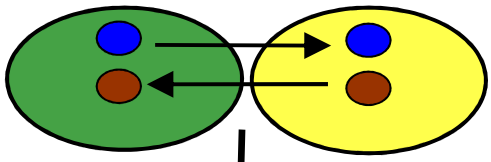
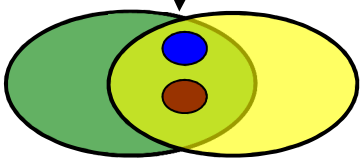
Phases	KD1 KD2	Enabling conditions
Recognizing		• Intellectual curiosity, • Serendipity, and • Encountering *ba*
Responding		• Positive perceptions, • Positive attitudes, and • Absorptive capacity
Renovating		• Dynamism, • Flexibility, and • Adaptability

Figure 2: The 3R Model of the Interdisciplinary Encounter between two Knowledge Domains

As it's name implies, the 3R model consists of three main phases and the naming of each phase, starts with the English letter "R", which stands for *Recognizing, Responding,* and *Renovating*. According to the model, KD1 and KD2 are two different knowledge domains, and the encounter between them happens through recognizing a knowledge domain, responding to it, and renovating the existing knowledge structure. For a successful interdisciplinary encounter, some conditions are required in every phase of the model.

7.1 Recognizing

As Youngblood (2007) argues, disciplines are by no means discrete entities– they necessarily overlap, borrow,

and encroach upon one another. KD1 and KD2 have some significant commonalities. The interdisciplinary encounter starts with the identification or recognition of the existence of KD2 from the knowledge of its appearance or characteristics through the studies, research and professional activities of KD1. The members of KD1 recognize KD2 through different ways of knowing. As research proceeds and the theories develop, the most common form of knowing a discipline is explicit, which occurs through articulated or documentary sources. Other ways of knowing are intuitive, experiential, and reflective knowing. Intuitive knowing, usually referred to as personal knowing, comes from direct action and experience, observation, and conversation when dealing with interdisciplinary studies, while experiential knowing involves participation and thus gaining experience through previous knowledge or from the experience of others. Reflective knowing involves drawing an image based on descriptions, reviews, analysis, and the evaluation of thoughts, assumptions, beliefs, theories and actions as reflected in the wider social context or in a particular environment. Because of some loosely connected theories and frameworks of the emerging discipline at the initial stage, KD2 is recognized and understood from diverse perspectives with ambivalent views of the knowledge domain and boundary of the discipline. The context and ways of knowing significantly influence one discipline in its understanding and response to another. The important enabling conditions for recognizing one knowledge domain by the other include:

- *Intellectual curiosity*: The curiosity of the individual, intellectual community, or the research group about an emerging discipline.
- *Serendipity:* Discovery of something by chance, (fortunate) especially while looking for something not related to the findings – one must have the eyes or ability to know the value of the findings.
- *Encountering ba:* Academic conferences, seminars, workshops, etc. for mutual learning, soliciting and acquiring new knowledge.

7.2 Responding

Responding is action, reaction or attitudes of KD1 to KD2. The degree of reaction or responses of KD1 is characterized by increased historical, social, economic, political and intellectual influences on KD2. O'Donovan and Roode (2002) observe that tension is consequently an inherent part of a discipline: conflicting forces seek to retain the status quo, or to change it. Similarly, Ferraro (2006) argues that many fields do not want to surrender areas of inquiry to new fields; rather, the source disciplines evolve to incorporate the new ideas that arise in what are often considered *subfields*. However, for a better integration and expansion of the knowledge domain, both disciplines need to share common knowledge contributing to both. Pierce (1999) argues that, in interdisciplinary research, the information transfer from one discipline to another can be affected in one of three ways: borrowing, collaboration, and boundary crossing. By borrowing, one discipline can import theories or methods from other disciplines; while collaboration with other disciplines can contribute to one's disciplinary literature; and by boundary crossing, the discipline can export theories or methods to other disciplines. The case analysis of LIS's encounter with KM shows a mutual interaction and knowledge borrowing between these two disciplines. LIS borrowed knowledge from KM regarding knowledge mapping, business and competitive intelligence, intellectual capital management, KM tools and technologies, KM strategies, organizational learning and behavior, tacit knowledge sharing, etc. KM, on the other hand, borrowed knowledge from LIS concerning the 'organization of knowledge' or 'information management'. These include classification and organization; information storage and retrieval; system analysis and design; database management, data mining, portals and information architecture, information networking and transfer, etc. Accordingly, in our model, KD1 borrows knowledge from KD2 and vice versa, a mutual borrowing through which both KD1 and KD2 can expand their knowledge domains. At the responding phase, the following enabling conditions can support successful interdisciplinary encounter between two knowledge domains:

- *Positive perceptions:* Positive insights, deeper understanding, and awareness of individual and groups about the new discipline.
- *Positive attitudes:* Positive views and strong motivations of individual and groups toward the new discipline.
- *Absorptive capacity:* The ability or capacity of one knowledge domain to value, assimilate and apply new knowledge, depending on the scope of relevant theories, concepts, underlying philosophies, and methodologies.

7.3 Renovating

Renovating is the act of improving or reorganizing the existing structure of a knowledge domain. Curricular renovation is a constant need, as Hazeri (2008) observed that the changing needs of society and the demands of workplace environments, along with the advancement of knowledge and technology, necessitate systemic educational reforms for every profession. As science proceeds, the connection between knowledge-claims, domain groupings, and descriptions tends to become tighter and tighter (Shapere, 1984, p.324). In interdisciplinary studies, the breadth and vigorous dynamics of a dominant paradigm between the disciplines play a determinant role in

borrowing, assimilating, and restructuring knowledge. As for example, both information and technology paradigms are dominant in LIS, and hence, LIS emphasizes these two dimensions of KM either in education or in practice. The incorporation of a new course or program requires the reorganization of existing educational and professional structures, including restructuring of academic programs, core contents, specializations and electives, the relationship with other neighboring disciplines, resource allocation, redefining the role and responsibilities of the profession, adjusting or modifying existing names, etc. Thus, renovation is an ongoing process that facilitates the expansion of the existing knowledge domain and strengthens interdisciplinarity. The more mutual knowledge borrowing that occurs between the participating disciplines, the more restructuring of existing knowledge will be needed. A more significant reorganization of knowledge will lead to a more significant convergence between two knowledge domains. A higher degree of convergence ensures a higher degree of interdisciplinary integration. The enabling conditions that are useful for renovating existing structure of knowledge include:

- *Dynamism:* The power or dynamics of a discipline and its dominant paradigm to improve its existing knowledge structure.
- *Flexibility:* Ability of a discipline to change itself easily by incorporating emerging discipline.
- *Adaptability:* Making knowledge, methodologies, and approaches suitable for new use, or adjusting them easily.

8. Suggestions

The following suggestions are made for better integration of KM into LIS.

i) Despite the growing interest of LIS academics in the inclusion of KM in LIS educational programs, the percentage of schools adopted KM is not satisfactory. Most of the schools have added one or two courses of KM at the Master's degree level, which is not sufficient for a better integration. More LIS schools should incorporate KM program into their curricula.

ii) LIS schools usually tend to focus more on information and technological perspectives than on business and human perspectives of KM. In such a situation, we suggest that LIS academics need to adopt a balanced approach to KM that considers wider audiences and market demand. Emphasizing earlier findings of other researchers (Rehman & Chaudhry, 2005; Sutton, 2007), we therefore suggest a strong interdisciplinary collaboration with other disciplines having KM interests.

iii) LIS practitioners have excellent data and information management skills, but they need to gain additional skills to work in the KM environment. KM practice in libraries will not succeed if the practitioners view KM just as the application of some KM tools and technologies. We therefore suggest that LIS practitioners need to broaden their understanding, to change their traditional mindset, and to apply a holistic approach to KM system design and library practice focusing on both explicit and tacit knowledge.

iv) Library practitioners should renovate the existing library environment and promote a knowledge-sharing culture by initiating communities of practice, the management of best practices, change management, organizational learning, and the use of appropriate knowledge-sharing technologies.

v) At present, there exist several names of the discipline of library and information science with an emphasis on information-orientation. In fact, LIS deals with data, information, and knowledge, but the philosophical and epistemological level of knowledge is higher than that of data and information. Several authors argued that the discipline should be renamed "Knowledge Science", because librarians are in fact manipulating knowledge (Ebrami, 1977; Zins, 2005). Considering the historical link of the library with knowledge and culture, and the emerging field of KM, we suggest that LIS academics and practitioners should rename the LIS discipline "Library and Knowledge Science".

9. Conclusion

In recent years, there has been a growing interest in KM education and practice on the part of many academic and professional disciplines. Library and information science (LIS) as one of the promoters of KM, has embraced the emergence of KM and incorporated it into the knowledge domain of LIS. LIS recognized KM through explicit, intuitive, experiential and reflective ways of knowing. The degrees of understanding of KM among the academics and practitioners were varied. LIS has positively responded to the advent of KM, and the important reasons for which they responded to KM were the role of the global knowledge economy, the evolving nature of the field of information, interdisciplinarity, domain expansion, the survival of LIS schools, trends in information technologies, and so on. LIS has assimilated the core content of KM based on the combination of varying proportions of major perspectives and skill-sets of KM with an emphasis on information management and information technology-oriented courses. The study also finds that LIS has incorporated KM following a partial adoption process through mutual borrowing of knowledge between LIS and KM. For better integration of KM into LIS-fold, both the academics and practitioners need to broaden their understanding, change traditional mind set, and renovate existing culture and structure of LIS. The foregoing discussion indicates that LIS has

encountered KM through recognizing KM, responding to it, and renovating the existing structure of LIS. Based on the case study of encountering between LIS and KM, this paper proposes a 3R model of the interdisciplinary encounter between two knowledge domains. In this process model, 'R' stands for *Recognizing, Responding* and *Renovating*. An interdisciplinary encounter begins with a knowledge domain recognizing the existence of another. Then, one of the knowledge domains responds to the other, which leads to a mutual borrowing of knowledge between both domains. Renovating is the final phase of the process, which refers to the reorganization of the existing knowledge structure based on the knowledge that is borrowed, and on the breadth of dominant paradigms and their vigorous dynamics taking place between the domains. The theoretical model built in this study is original in nature broadening its scope from LIS and KM to the generalization of other disciplines.

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