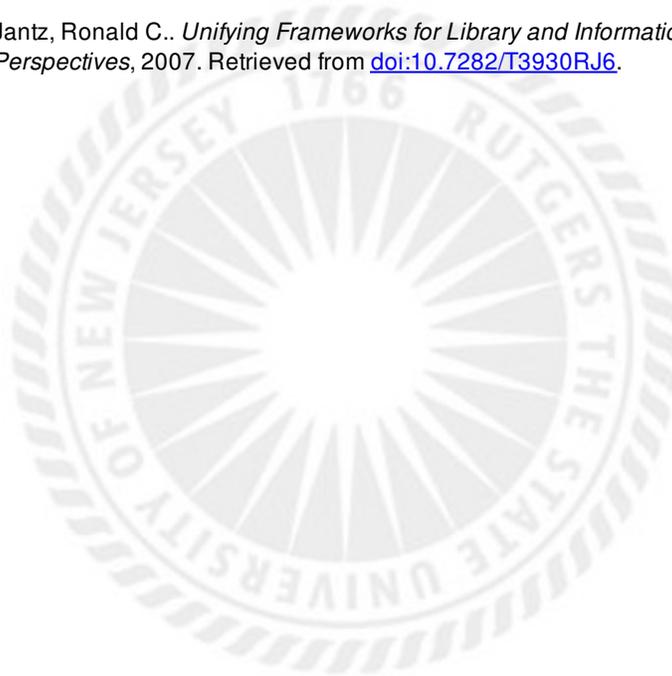


## **Unifying Frameworks for Library and Information Science: An Analysis of Three Perspectives**

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# **Unifying Frameworks for Library and Information Science: An Analysis of Three Perspectives**

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## **Abstract**

This article argues that there are emerging new roles for academic librarians and that a more focused discussion on the theoretical foundations of Library and Information Science (LIS) will provide guidance for both the discipline and the profession. The analysis herein examines a possible theoretical foundation or framework for LIS from three perspectives: the philosophy of information, social epistemology, and cyber-semiotics. The primary advocates of these three perspectives are L. Floridi, J. Shera, and S. Brier respectively. This analysis addresses three questions: how does each perspective view LIS?, can the perspectives clarify the relationship between librarianship and information science, and can one of these perspectives suggest how the profession of academic librarianship should transform itself to meet the demands of the scholar in the 21<sup>st</sup> century? The analysis will proceed along four dimensions: a) knowledge and information, b) the focus on society and the individual, c) the meaning and structure of information, and d) how a unifying framework of LIS might deal with the practice of librarianship.

## **Introduction**

In the 21<sup>st</sup> century, academic librarians will be called on to undertake quite different roles in managing knowledge and the flow of information. A few short years ago, Buckland (1988) suggested that a primary function of libraries was to provide access to books.<sup>1</sup> With the onset of mass digitization, there is certainly cause to reevaluate this assumption. We are in the midst of a technological revolution, perhaps as profound as the revolution resulting from the invention of the printing press. This paper suggests that there are emerging new roles which academic librarians should undertake, and these roles can be situated in a general theoretical model which

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<sup>1</sup> Buckland, p. 6

encompasses practical librarianship and the field of Library and Information Science (LIS). A more comprehensive model for the profession of librarianship will help us understand what is core to our profession, what we should be learning in library school, and what new skills and competencies are required in this digital age. Librarians are pragmatists and their devotion to service and the practical aspects of delivering information to the user is admirable. However, it appears that the practicing librarian focuses excessively on providing a service and has not engaged in the debate about the future of the profession. Thinking in terms of extremes might help clarify issues confronting the profession. For example, what if most books written in the English language have been captured in digital form and are available as a corpus of online searchable full text? What if students in academic settings do not come to the library reference desk anymore? These questions pose serious challenges for the profession. To hopefully shed some light on these questions, this analysis discusses four major issues or points of contention that surface in the writings of Shera, Floridi, and Brier, namely a) knowledge and information, b) the focus on society and the individual, c) the meaning and structure of information, and d) how a unifying framework of LIS might deal with the practice of librarianship. This article attempts to extract insight from these perspectives that might suggest a unifying framework for the profession of librarianship and which could lead to ways in which the profession can transform itself to meet the challenges of the 21<sup>st</sup> century.

### **Background and Literature Review**

Although there is only a small coterie of scholars who are theorizing about the unifying framework of LIS, there appears to be a steady stream of publications on this topic since the early 1900s. This debate to find the unifying theory for the profession has been ongoing for the better part of the 20<sup>th</sup> century and continues, as we shall see, into the 21<sup>st</sup> century. Hjørland (1999), in his analysis of the practice, theory, and philosophical basis of LIS, indicates that earlier scholars have uncovered some 700 definitions of information science. This conceptual chaos results from many inappropriate practices in the field such as circular reasoning, inappropriate analogies, and disregard for literature without the science or technology label. He claims that we can emerge from this chaos by achieving a deeper understanding of the field from the study of the underlying philosophical assumptions. Similarly Brookes (1980) states, "Theoretical information science hardly yet exists." He discerns "scattered bits of theory"

which cannot be readily integrated into any coherent framework. Brookes indicates that LIS should focus on the fuzzy boundary between objective knowledge and subjective knowledge. Of all the social sciences, information science is most concerned with the interactions between mental and physical processes and it is a special responsibility for the LIS profession to clarify this boundary. In his many philosophical writings, Shera has succinctly stated the LIS professional dilemma: "The first responsibility of a profession is to know itself, which means, first, knowing what a profession is; second knowing what kind of a profession it is; and third, knowing what differentiates it from all other professions." (Shera, 1965)<sup>2</sup>. Many of Shera's observations about the library profession 40 years ago appear to be very relevant today. Shera casts librarians as "reluctant followers" who have failed to see the deeper meaning of what they do and have thus been unable to "raise their activities to the level of a true profession". Various scholars have commented on this identify crisis from different perspectives. There continue to be tensions both within the field of LIS and forces pushing from outside the profession. For example, Karamuftuoglu (2006) has proposed a framework that would unite information science and the information arts as a single field of study. Brier (2004) claims that ". . . a science must at least have a reflected meta-theory of the subject over which it claims cognitive authority." In recent years, the term "knowledge" has begun to permeate our language within LIS. Courses are now offered in knowledge structures and knowledge management. Budd has philosophized extensively on this topic and suggests that the profession should think seriously about what constitutes knowledge in LIS (Budd, 2001)<sup>3</sup>.

The practicing librarians' abdication of part of their role to shape the profession has some risk associated with it. For example, in Markey's survey (2004) of trends in the LIS curriculum, she points out that "library educators should avoid placing too much emphasis on the users' niche because it places them in an intermediary role" and such emphasis may lead to librarians becoming increasingly irrelevant. Shera, as an apologist for the profession of librarianship, has tried to jolt us out of our apathy and fixation on traditional practices. He (Shera, 1965)<sup>4</sup> states that "the history of American librarianship during the last century is indeed a record of lost opportunities." Danton (1934), in writing some 40 years before Shera issues a plea for a philosophy of librarianship and for librarians to engage in the debate about their profession. Lougee

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<sup>2</sup> Shera, p. 162.

<sup>3</sup> Budd, p. 206.

<sup>4</sup> Shera, p. 187.

(2002) aptly describes the dilemma that libraries are facing, in particular the “fundamental hurdle” to make visible the library role in innovation. The dilemma is accentuated by statements in the popular press and even some professional journals that indicate that librarians can be replaced by powerful search engines such as Google. Wiegand has written extensively on the importance of the traditional aspects of the profession of librarianship and the importance of the library as “place”. In a recent article (Wiegand, 2003), he states that every year for the past five years college and university librarians have answered over 100 million reference questions – more than three times the attendance at college football games. This perspective conveniently ignores the precipitous plunge in reference desk usage over the past ten years. When the author arrived at Rutgers University Libraries in 1997, the total count of reference desk visits of all types at Alexander Library for the academic year 1996 – 1997 was estimated to be about 100,000. In a recent email communication (Mulcahy, 2006), the librarian who coordinates reference services at Alexander Library indicated that reference counts for the busiest month of the Fall semester (October) had dropped from 3079 in year 2003 to 1898 in year 2006, a reduction of 38% in four years. In round numbers, if one were to estimate an average count of 1500 per month for the total academic year 2006 – 2007, this results in a total of 18,000 and a reduction of almost 80% from the 1996 – 1997 academic year. The research library official statistics provide further evidence of this trend (Association of Research Libraries, 2006). In a sampling of ten state university library statistics from 1997 to 2004 (the most recent year available), the average percentage drop in reference queries for these eight years was 51.2%.

Is there a core to the profession that can help clarify the aims and purposes of the profession? Can this core be viewed as largely independent of the surrounding environment, specifically technology and the physical building? Can one or perhaps all three perspectives in this analysis provide answers to these questions.

### **Definitions**

A philosophy or unifying framework in the context of this paper can be considered to be a systematic body of general concepts that can clarify purpose and meaning of the LIS discipline and the profession of librarianship.

What is librarianship? According to Shera (1972)<sup>5</sup>, librarianship is the assembling, preserving, and making available for use the records of human experience. However, given the professional issues cited previously, this definition appears to be incomplete. Librarianship is more than technical expertise and a set of skills that are used to provide service to information seekers. Budd (cited in Dougherty, 2006) uses the term “praxis” and he defines the praxis of librarianship as “action that carries social and ethical implications and is not reduced to technical performance of tasks.” Praxis also implies feedback in the sense of applying theory to practice, critical reflecting on these actions, and using this knowledge to inform future actions. This view provides a critically important aspect of the profession, i.e. that the profession is not static or stable and is ever-changing. For example, there are new forms of scholarship that are emerging and librarians need to understand how these scholars work and how they use information.

What is information? The many definitions of information are likely creating some conceptual chaos in the profession. However, it is useful to describe a practical framework for purposes of understanding. Information is input to knowledge and comes from direct human experience or through “documents”. Knowledge is that which an individual or a group knows and there can be no knowledge without a knower (Shera, 1972)<sup>6</sup>. The individual shapes and molds information inputs to produce knowledge. This approach is similar to Brier’s cyber-semiotics. Information is understood as potential (i.e. potential knowledge) until someone interprets it. The signs in printed text or other information entities need interpretation in order to release knowledge (Brier, 2004). Where is information? Floridi (2004) uses a food analogy to help us understand this question. Most people would say that food exists independently of the consumers of food. Similarly information exists independently of people who process information. On the other hand, in Floridi’s analogy, grass is food only for a grass-eater. Similarly, it is likely that a social science dataset will not comprise information for a theoretical physicist. Floridi claims that this dispute about the location of information is pointless; that information can be considered to have both internal and external attributes. Brookes (1980) offers a simple, compact and yet very elegant way of expressing the relationships between information and knowledge in the following fundamental equation:

$$\mathbf{K[S] + \Delta I = K[S + \Delta S]}$$

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<sup>5</sup> Shera, p. 197.

<sup>6</sup> Shera, p. 117.

This equation can be interpreted as follows: the knowledge structure  $K[S]$  is changed to a new modified structure  $K[S + \Delta S]$  by the processing of new information  $\Delta I$ . The knowledge structures are internal to the knower as discussed above and the  $\Delta I$  are information increments that are processed by the individual to create a new internal knowledge structure. This equation also helps us understand the process and the boundary between objective information and the subjective mental state of an individual. Brookes suggests that it is a special responsibility of information science to understand the interaction between mental and physical processes or between the objective and subjective modes of thought.

Wright (1976) offers an interesting and intuitive definition of information which also highlights the change in knowledge structure that Brookes represents in his fundamental equation. Wright claims that the term is best defined from the word itself and he accentuates the syllable “form” in “in-FORM-ation”. “To ‘inform’ someone is quite literally to ‘create form in him’ “. This emphasis on form relates closely to Brookes’ fundamental equation for how knowledge structures are changed.

### **Analysis of the Three Perspectives**

In the analysis that follows, we will examine the different perspectives of social epistemology, the philosophy of information, and cyber-semiotics with an eye to how each can help elucidate the aims and purposes of LIS as a discipline and librarianship as a profession.

### **Social Epistemology**

Social epistemology as a theoretical framework for librarianship has been discussed extensively by Jesse Shera. There are three very interesting aspects to Shera’s approach: the individual, knowledge, and the social aspect. First, from the perspective of the individual, the librarian can be considered the mediator between the reader and the book (Shera, 1975)<sup>7</sup>. To a large extent, this perspective is valid today if we change “book” to “document” where document can be any physical artifact that contains information including the digital object. Related to the individual, Shera makes a very profound statement: “. . . the key to the true meaning of librarianship is to be found in the power of the brain to translate the symbolism of the written word into vicarious experience, assimilate and store this experience in the memory, and reactivate

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<sup>7</sup> Shera, p. 167.

it on demand.” Shera (*ibid*)<sup>8</sup> continues this focus on the individual by indicating that we should “. . . focus the attention of the librarian on the central problem of the discipline – the relation between the mind and the printed page.” Significantly, in these statements there is a major emphasis on the individual and the human brain’s capability to derive meaning from the symbols of the written record. As we shall see later, Shera’s insights relate closely to the emphasis on meaning and individual interpretation in the cyber-semiotic approach.

Shera’s second perspective connects to social epistemology (SE). Interestingly, Shera seems to have difficulty reconciling the emphasis on the individual with a similar emphasis on society resulting from his advocacy of social epistemology. He indicates that SE lifts the study of intellectual life from the individual to the society, nation, and culture as a whole. So, what does Shera have in mind when he applies the term “social” to epistemology? He envisions SE as “a framework for the investigation of the complex problem of the nature of the intellectual process in society.” (Shera, 1972)<sup>9</sup>. Further (Shera, 1975)<sup>10</sup>, he states that the purpose of librarianship is to “maximize the utility of recorded knowledge for the greatest possible benefit to the human race.” Shera suggests we shift the focus of epistemology from the individual to society and, further, that the profession must understand the way in which society knows. Finally, he comes back to the dual approach by indicating that the state of knowing is both personal and social and “. . . a librarian must operate in two worlds at once – the microcosm of the individual and the macrocosm of the culture in which the individual resides” (Shera, 1972)<sup>11</sup>. Obviously, librarians must operate in a social environment in many different ways, however in this author’s opinion, Shera takes us too far afield when he suggests that librarians should concern themselves with how society knows. Ultimately, librarians must make available the records of human experience and these records are delivered to an individual as information. The individual may turn these records into knowledge. The individual as a member of society can thereby contribute to the process by which society gains knowledge. Given our best understanding of the two domains of knowledge and information, it seems that librarianship focus is better placed on the individual and information.

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<sup>8</sup> Shera, p. 168.

<sup>9</sup> Shera, p. 112.

<sup>10</sup> Shera, p. 167.

<sup>11</sup> Shera, p. 119.

Shera further states that librarianship as the management of knowledge is rooted in epistemology, i.e. knowledge of knowledge itself. Specifically librarians must understand the way knowledge is disseminated through society. The theoretical aspects of librarianship must be operationalized and, in this sense, the connection to society and to knowledge is not well defended by Shera. Shera's earlier statements that focus on the individual and the librarian as a mediator between the individual and the book seem to be in conflict with his view of LIS as based on social epistemology with the emphasis on society and knowledge. Although he makes comments about the way in which knowledge is disseminated, he lapses back into using metaphors like the "transcript" of the human record which is really more about information than knowledge. We cannot ultimately know if the results of mediation between a user and the document ever result in knowledge. A practicing librarian should understand how an individual or a group processes information to produce knowledge. However, as Brookes has pointed out, there is no way of inspecting private knowledge structures of an individual without asking questions of the individual. Although this might be appropriate LIS research, it does not seem to be a useful endeavor for a librarian.

Shera also seems to anchor part of his SE-based view in the dynamics of the library as a physical building. Libraries do provide a social setting for users, but it is hard to imagine how this social setting can become part of the basis for librarianship. Although he was very attuned to technological advancements and the impact of the computer, even in the 1960s, he could not have predicted the impact of the Internet and digital libraries. Just as we cannot anchor our profession to technology, we also cannot anchor it to a physical building. Perhaps Shera's earlier statement might be better restated to the following: the profession is rooted in the management of information and requires knowledge of information, its structure, creation, access and preservation.

### **Philosophy of Information**

Information has become so pervasive in our lives that, in Floridi's view, it has become as philosophically important as being (metaphysics), knowledge (epistemology), the nature of right and wrong (ethics) and meaning (philosophy of language). Floridi claims that LIS can be theorized as applied philosophy of information. The philosophy of information is a phenomenon based theory rather than a meta-theory such as the philosophy of physics. As such, the philosophy of information is concerned with phenomena from the world of information. Floridi (2002) provides a two-part definition of

the philosophy of information: a) the critical investigation of the conceptual nature and basic principles of information and b) the elaboration and application of information-theoretic and computational methodologies to philosophical problems. Philosophical analysis into questions such as “what is information?” and “is information inside the mind, external to the world or in some intermediate space?” can help develop the underlying theories that support librarianship.

Information is at a more fundamental level than knowledge and, therefore, the philosophy of information provides a much broader base for LIS. Focusing only on knowledge is limiting and LIS has a much wider scope than epistemology. As applied philosophy of information, LIS can focus on the more specific sense of information as recorded data or documents rather than the more philosophical questions about the nature of information. This broad scope enables LIS to deal with all types of information from all of the major knowledge areas: humanities, social sciences and the sciences.

Shera claims that librarianship involves the management of human knowledge. Floridi sees a problem with this view and states that LIS works at the level of information rather than knowledge. Floridi (2002) states that LIS has as its objective “. . . not knowledge itself but the information sources that make it possible.” He further defines LIS as the applied philosophy of information which is concerned with documents, their life cycles and the procedures, techniques, and devices by which these are implemented, managed, and regulated. As an example, Floridi suggests that we can develop a common ontology for informational entities, including the appropriate data structures which constitute the nature of the entity and a collection of operations or functions which define how the object behaves. This statement accurately defines one of the important tasks in digital libraries which is one of defining the essential characteristics (structure and behavior) of generic digital objects. As applied philosophy of information, LIS might also be involved with information dynamics, the ethics of information, and the social phenomena that characterizes the information society. For example, one might ask that the information process respect the “ethical claims attributable to the informational entities involved, and hence in improving or impoverishing the infosphere” (Floridi, 2004). In an applied sense, this latter area could include issues of the integrity of a digital object and whether one can put trust in a digital object that has been moved across many operating systems and file formats. Floridi’s concept of applied philosophy of information and his emphasis on the life cycle of

information also provides a framework for integrating archival science with LIS. Floridi claims that all of these areas are beyond the scope of social epistemology.

Ian Cornelius (2004) provides an interesting analysis of Floridi's assertion that the unifying framework for LIS should be based on applied philosophy of information. To establish a starting point, Cornelius makes it clear that there so far has been no common view or agreement in the LIS community about the theoretical or philosophical basis of LIS. However, Cornelius' analysis suggests that the philosophy of information might be workable as a basis for LIS with less focus on a message transfer system and more on the individual and the practice of librarianship. In his background comments, Cornelius clarifies LIS as having a dual focus first, as part of academic endeavors to produce works on information retrieval and information seeking behavior and, secondly, toward the practice of running libraries and other information agencies. Significantly he notes that the practice of librarianship is closely related to LIS but that it cannot be considered a natural extension of the field. Related to his overall concern, Cornelius states that librarianship is a social practice and any philosophy of LIS must account for individual behavior within social practice. For example, a patron in a library relies on a variety of services such as help in finding a book, extending a loan, or locating facilities within the library building. Any philosophy of information must offer an explanation of these phenomena and how librarians must remodel themselves in a changing information environment. Floridi's confusion or perhaps the flaw in his approach is that the philosophy of information does not take into account the practical work of managing the library and the consideration that much of this work is not normative, i.e. it must take into account the user's view of what is acceptable. Cornelius cites a specific example in the work of a librarian who is preparing a subject bibliography in sociology. If the reader fails to accept the librarian's view of subject orientation and content, the bibliography will fail. The work of preparing the bibliography cannot occur in isolation and independent of user needs. As applied philosophy of information, Floridi's approach is confining in placing undue emphasis on a message transfer system of information and the representation of information exclusively in documents thus ignoring the awareness a librarian must have of the individual need. Cornelius sums up his critique by suggesting that we need an approach that includes a sense of individual involvement in our culture: "The link between information, documents, and knowledge is the concept of learning and it is in a commitment to the processes of learning that LIS builds its sense of a discipline."

Librarians cannot effectively manage documents on behalf of users without a sense of purpose and culture.

The second major problem with Floridi's approach, in Cornelius' view, is the concentration on a message transfer concept of information. Coming back to the definitions posed earlier, it seems that there is a general acceptance that there is a flow or continuum from data to information and finally to knowledge and that knowledge exists only in the mind of the individual. Cornelius raises the question of how information is related to meaning and when does data become information and information become knowledge? Clearly, information must have some connection to meaning and semantics and semantic content cannot be limited only to the message. Cornelius states that information is interpreted differently by individuals and "Information becomes the function of an individual's cognitive apparatus, . . .". Librarians working within a cultural context and understanding individual needs can recognize what counts as information for a specific user. In the analysis of our third perspective, cyber-semiotics, we will see more of this emphasis on the meaning and semantics of information.

### **Cybersemiotics**

In the third perspective to be reviewed here, Brier (2004) discusses the cyber-semiotic approach and proposes this approach as a candidate for a unifying framework of LIS. Cybernetics as an information processing discipline explains how systems, both biological and man-made, are able to function and how the failure of a system can result from noise, overload, or a mismatch between structure and function. Semiotics deals with the transmission of meaning and how communication gaps can be bridged by the use of shared signs (Craig, 1999). Brier's basic model is that potential knowledge is carried in signs and signs need interpretation to release knowledge. Interpretation of these signs is based on the total worldview and semantic network of the individual.

Brier's starting point is that much of LIS research and specifically work in information retrieval is based largely on an information processing or cybernetic view. He suggests that we need to combine both the cybernetic and semiotic aspects of document classification and retrieval. The crucial question, in Brier's view, is that of interpreting the document's meaning for the individual. A major problem with LIS is that the semantic and computational aspects divide the discipline into two largely non-intersecting domains. A more unifying framework would open LIS to a general theory of how signs acquire their meanings. He states bluntly: "The information-processing

paradigm will never succeed in describing the central problem of mediating the semantic content of a message from producer to user because it does not address the social and phenomenological aspects of cognition.” Brier proposes that we start in the middle, i.e. with the process of knowing, rather than the information object or the individual. The process according to Brier is the interpretation of the signs and symbols by the receiver. Words do not carry meaning in themselves. Meanings are perceived based on the perceivers experience. Brier’s approach relates very much to how Buckland (1988)<sup>12</sup> defines information. Information is not a thing or an object but a process – it is the process of becoming informed.

Although deriving meaning from an information object is essential, defining information as a process again seems to take us in a direction that is not readily compatible with either LIS or with the practice of librarianship. However, it seems clear that LIS must focus on both information as an object and the process of transforming information into knowledge. Brier’s suggested framework is limiting in that it seems to be primarily a reaction to the cybernetic-information processing focus of LIS. For example, he doesn’t ever address where the traditional services or the practice of librarianship might fall in his unifying framework. Nevertheless, the cyber-semiotic perspective does add a significant aspect to the discussion of these three perspectives. In his discussion of the implications of the cyber-semiotic approach, Brier states that we can never expect machines to solve the complexity of human communication without human mediation. His example cites the BIOSIS index as a large bibliographic database created by biologists for biologists. If a chemist wants to use BIOSIS, she must somehow learn the vocabulary of biologists before she can effectively use the database. A simple analogy is the meaning of the word “space” and how this meaning is quite different for architects, mathematicians, and astronomers. Given that scholarship is increasingly inter-disciplinary, indexers must understand the community of discourse in order to provide effective access to information. This aspect of the cyber-semiotic perspective points to possible new roles for librarians.

## **Discussion**

In addressing the questions posed previously, this discussion will highlight issues with the three perspectives along the four dimensions: a) knowledge and information, b)

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<sup>12</sup> Buckland, p. 115.

the focus on society and the individual, c) the meaning and structure of information, and d) how a unifying framework of LIS might deal with the practice of librarianship.

### *Implications for LIS*

A unified framework for LIS can utilize aspects of all three perspectives discussed in the previous sections. However, the approach represented as the applied philosophy of information has some very strong points for having the potential as a unifying framework for LIS. First, as Floridi points out, applied philosophy of information is phenomenon-based and treats information as specific, concrete entities. The philosophy of information provides a very rich domain for LIS, a focus on information as an objective entity, and a framework that can be divided into many sub-fields. For example, LIS could accommodate the sub-field of information art as Karamuftuoglu (2006) proposes. Floridi discusses how the philosophy of information could include the study of the cognitive abilities of information seekers, new information modeling approaches including ontologies, and information social and ethical problems such as trust. Regarding the information-knowledge dimension, the primary focus of LIS is more properly placed on information and the process for turning information into knowledge. Shera's emphasis on knowing in society takes us into the study of subjective, internal mental states and societal issues, areas that are domains for psychology and sociology. Finally, Brier's emphasis on meaning and semantics can be included under the philosophy of information. Floridi explicitly defines a sub-field of applied philosophy of information as cognitive and linguistic abilities including information-theoretic semantics.

Floridi's approach does seem to suffer from not properly considering some of the practical aspects of the profession of librarianship. In the author's view, this criticism is not a serious flaw. It would be good to reexamine some of our assumptions regarding the practice of librarianship. For example, librarians, as information specialists, are probably not well suited for managing the people and physical resources of a large library and this task is better handled by those trained in management.

### *Implications for Academic Librarianship*

Can any of these insights help clarify or perhaps suggest new directions for library practice? In general we can conclude that advances in technology are leading to dramatic changes in the profession of academic librarianship. Are we looking to a future that does not have librarians and in which the academic library is primarily a social

gathering point? As the statistics demonstrate, librarians will need to acknowledge that person-to-person intermediary service (e.g. reference service) has dramatically declined and will continue to decline as advances occur in the areas of ontologies, artificial intelligence, intelligent agents, web search engines and the semantic web. Reference librarians will need to turn their attention to other ways of managing information for the user.

Although Brier's perspective on the importance of meaning and Shera's emphasis on the social aspects of librarianship are relevant in this discussion, the philosophy of information as a possible unifying framework can suggest new directions for how academic librarians might view their profession. For example, librarians might consider returning to a role that was once very much a part of librarianship but is not evident in the profession today – the bibliographer. Some thirty years ago, Shera (1972)<sup>13</sup> claimed that the profession had retreated from its bibliographic responsibilities and this would not have happened if there had been a proper understanding of the role of the library. In today's world, the bibliographer would be someone with a broad and deep understanding of their particular subject field and one who could bridge to other related fields. In order to undertake this new role, the librarian would have to understand scholarship in different areas, specifically ones in which there were emerging trends in inter-disciplinary research. Berners-Lee (2001) has described the major components of the semantic web, one of which is the collection of ontologies that describe the relationships among terms. An ontology (Kim, 2005) provides a vocabulary for representing knowledge about a domain and describing specific relationships within the domain. This new bibliographer, rather than doing person-to-person reference, might actually develop ontologies and the relationships between ontologies that would help with context, meaning, and semantics of information on the web. Floridi has identified this focus on ontologies and re-conceptualizing the structure of information as an explicit area of the applied philosophy of information. Others are pushing ahead in the same direction. In his recent book on information classification, Szostak (2004) suggests that library catalogs are incorrectly organized around disciplines rather than phenomena and he introduces an approach that encourages borrowing across disciplines. This new bibliographer role would also include significantly different social aspects. The classical view of a reference librarian is one who helps an individual find an information resource. Bridging between disciplines would require involvement in how scholars are doing

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<sup>13</sup> Shera, p. 186.

research and a librarian would in some sense have to embed themselves in the research process as a member of the research or project team in order to bridge the vocabularies between disciplines. This difficult work would require not only becoming familiar with new subject areas but would also likely be very social in working with groups of students or researchers.

Floridi (2004) indicates that LIS as applied philosophy of information can undertake research into the conceptual nature of information and its dynamics. He references specifically the concept of the life cycle of information and issues with information ethics. In the digital world, the roles of librarian and archivist are merging. In a sense, the archivist is communicating with someone in the future by capturing as much as possible of the meaning and context of a particular artifact so that someone several hundred years later will be able to access the digital object and understand the information contained in the object. This task goes well beyond the preparation of descriptive metadata for a particular digital object. Bowker (1999)<sup>14</sup> reinforces this point in the following quote: “At its most abstract, the design and use of information systems involves linking experience gained in one time and space with that gained in another, via representations of some sort.” If we archive a digital map relating to a battle in WWII, we want to understand the role of the map, who used the map, in what battles and what impact its use might have had on the outcome. Archiving digital media becomes even more challenging given the many standards and the inability to do automatic indexing of media. Digital librarians and archivists will need to understand the methods for maintaining a digital object over its life cycle and what constitutes trust in the digital world. Concepts such as the “digital original” will need to be precisely defined. Scholars will want to know if they can trust the integrity of a digital object. These areas represent new endeavors or significant extensions for the profession of academic librarianship and all fit nicely into the unifying framework proposed by Floridi.

### **Summary and Conclusions**

By focusing on information as an objective entity, the philosophy of information provides a very broad unifying framework for LIS and a domain which would seem to be natural for information science and librarianship. Although Shera has written elegantly and persuasively about the importance of librarianship, the emphasis on knowledge in society seems to be misplaced as a framework for LIS and librarianship. Brier’s

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<sup>14</sup> Bowker, p. 290.

emphasis on cyber-semiotics could be included as a sub-field under the philosophy of information.

To further develop and refine the applied philosophy of information as a unifying framework, we can come back to Budd's concept of praxis. This concept suggests that librarians need to invest time in theorizing about their profession and reflecting the results in their practice. This engagement is not just an idle mental exercise and might provide clues as to how to take the profession forward. For example, reference librarians typically provide insight to students about the value of information. However, if reference librarians are no longer in contact with students at the reference desk, it will be difficult to understand the student's context. With many students obtaining their information from the Internet, how do librarians interact with students to understand their needs? Librarians should also think about how librarianship is part of LIS. By engaging more in what information scientists do, librarians can affect the research direction of information scientists. As a result, librarians may be able to transfer more of the results of research into practice.

Brewerton (2003), in reviewing Foskett's 1962 paper emphasizes the need for reflection. He indicates that reflection matters because it is continuous with practice and "Reflection can have a positive effect on how we function on a day to day basis". The profession of librarianship is clearly changing and we need theory to help us move in the right direction. Weissinger (2005) indicates that librarianship risks intellectual isolation as it remains aloof from theorizing about itself and the nature of information. Perhaps one of the most important new roles for professional librarians is to engage in this ongoing reflection. The unifying framework for LIS may not be readily achievable but the debate will produce useful ideas to help guide the discipline and the profession.

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