On defining library and information science as applied philosophy of information

LUCIANO FLORIDI

Abstract

This paper analyses the relations between philosophy of information (PI), library and information science (LIS) and social epistemology (SE). In the first section, it is argued that there is a natural relation between philosophy and LIS but that SE cannot provide a satisfactory foundation for LIS. SE should rather be seen as sharing with LIS a common ground, represented by the study of information, to be investigated by a new discipline, PI. In the second section, the nature of PI is outlined as the philosophical area that studies the conceptual nature of information, its dynamics and problems. In the third section, LIS is defined as a form of applied PI. The hypothesis supported is that PI should replace SE as the philosophical discipline that can best provide the conceptual foundation for LIS. In the conclusion, it is suggested that the 'identity' crisis undergone by LIS has been the natural outcome of a justified but precocious search for a philosophical counterpart that has emerged only recently: namely, PI. The development of LIS should not rely on some borrowed, pre-packaged theory. As applied PI, LIS can fruitfully contribute to the growth of basic theoretical research in PI itself and thus provide its own foundation.

1. *Introduction*

When Don Fallis kindly invited me to contribute to this special issue of *Social Epistemology*, we agreed that it would have been interesting to investigate the conceptual triangle constituted by theoretical studies in library and information science (LIS), social epistemology (SE) and a new area of philosophical research that in other contexts[1] I have defined as the philosophy of information (PI). This paper can be read as an exploration of the internal forces regulating the location and distance between three poles: LIS, SE and PI. Figure 1 summarizes the main thesis defended in the following pages.

Let me explain it. LIS is strictly related to both SE and PI, but in the first section I try to show that SE cannot provide LIS with a satisfactory foundation. In terms of family resemblance, LIS and SE are more like siblings and should be understood as

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Author: Luciano Floridi, Faculty of Philosophy, Department of Computer Science, and Programme in Comparative Media Law and Policy, Wolfson College, Oxford University, Oxford, UK; e-mail: luciano.floridi@philosophy.oxford.ac.uk
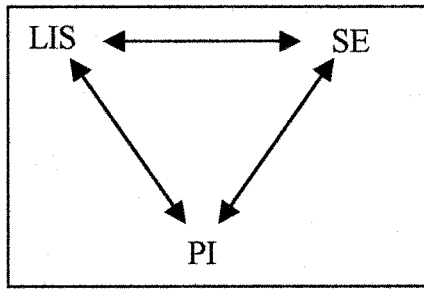
Figure 1.   The foundational triangle

sharing a common parent, namely PI. PI is the philosophical area that studies the conceptual nature of information, its dynamics and problems. I define it in the second section, where PI is succinctly introduced. In the third section, I put together the two strands and, following Herold (2001), I try to show that LIS should be understood as *applied PI*. In the conclusion, I advance two further suggestions. First, the 'identity' crisis undergone by LIS was the natural outcome of a justified but precocious search for a philosophical counterpart that has emerged only very recently, namely PI. For many decades, researchers in LIS have been asking the right questions but researchers in philosophy were not yet ready to answer them. Second, a good test for a 'foundational' candidate is to check whether it is able to learn from its applied counterpart. I argue that PI passes this test. The development of LIS as applied PI can fruitfully and substantially contribute to the growth of basic theoretical research in PI itself. LIS does not need to acquire some ready-made philosophical foundation, it can play a key role in shaping one.

2.   *Social epistemology cannot provide a foundation for library and information science*

Library and information science (LIS) has often been closely associated to philosophy because of the *level, scope* and *topics* of their investigations.[2] The relation between the two fields seems intuitive and undeniable, but specifying its precise nature has proved a complex and controversial task.

It has been suggested, rather influentially, that both disciplines share the same metatheoretical *level* of investigation: 'Librarianship and philosophy, while each possessing unique material content (such as it is), very probably have the same ultimate forms; and they are both metasciences par excellence' (Wright, 1977, pp. 11–12, cited in Herold, 2001). This view is suggestive but incorrect, as I shall argue in section 3.

Regarding the *scope* and *topic* of investigation, it has been held that:

> Like your profession [librarian], mine [philosopher] also has thrust upon it, as its appropriate domain, the whole of knowledge, the whole of culture; nothing is supposed to be foreign to us, and we ought to be prepared under suitable circumstances to be helpful with regard to any and every area of human concern. Like you, we cannot even begin to occupy ourselves with the substance and content of this endless domain, but only with its form, with its structure, with its order, with the inter-relations of the various parts. (Kaplan, 1965, cited in Gorman, 2000)

Unfortunately, this suggestion is unsatisfactory because too vague. LIS and philosophy certainly share an encyclopaedic scope, but this holds equally true of science in general. Philosophy, like science, is an umbrella word for a large variety of disciplines. We need something much more specific, if we wish to understand its relation with LIS. This requirement has been well expressed by Hjørland (2000, p. 6): 'The real challenge for information science [that is LIS] is therefore to develop specific knowledge, which is relatively independent of subject knowledge, but which is not an empty abstraction'.

A classic attempt to solve the previous difficulties has been made by interpreting LIS in terms of social epistemology (SE). Shera (1961, 1965, 1970, 1973) has been one of the leading figures in this trend (see Rawski, 1973). He argued that:

> Social epistemology' [...] will provide a framework for the effective investigation of the entire complex of problem of the intellectual processes of society–a study by which society as a whole seeks a perceptive relation to its total environment. It should lift the study of intellectual life from that of a scrutiny of the individual to an inquiry into the means by which society, nation, or culture achieves understanding of the totality of stimuli which act upon it. The focus of this new discipline will be upon the production, flow, integration, and consumption of all forms of communicated thought throughout the entire social pattern. From such a discipline should emerge a new body of knowledge about, and a new synthesis of, the interaction between knowledge and social activity. (Shera, 1961, pp. 15–16)

LIS is certainly close to social epistemology insofar as both disciplines are interested in the social dynamics of their object, have a wide scope and an empirical orientation. Nevertheless, this approach too fails to be fully satisfactory. SE cannot provide a foundation for LIS. The task of this section is to show why.

Broadly speaking, SE can refer to two separate fields of research:[3] the *Sociology* of Knowledge (SoK), that is the descriptive and empirical study of the historical causes and conditions of (what is ordinarily taken to be) knowledge; or the *Epistemology* of Social Knowledge (ESK), that is the critical and conceptual study of the social (multi-agents) dimensions of knowledge.

Unlike SoK, LIS has a normative stance and hence requires more than a purely descriptive approach. The library is a place where educational and communication needs and values are implemented, defended and fostered, where contents are assessed and selected for the public, and where practices like cataloguing, for example, are far from being neutral, evaluation-free activities.[4] This normative stance makes LIS lean towards ESK.

At a time when sociological approaches were fashionable, Shera explicitly identified the distinction between SoK and ESK and defended the importance of interpreting librarianship in terms of the latter rather than the former (see for example Shera, 1970, pp. 107–108). Shera had a very inclusive conception of ESK. Not only did he think that it was basically 'epistemology made social'; he also saw it as a theory of everything that might be generally understood in broad epistemic terms:

> Such discipline is here denominated, for want of a more accurately descriptive term 'social epistemology', by which is meant the study of those processes by which society *as a whole* seeks to achieve a perceptive or understanding relation to the total environment–physical, psychological, and intellectual. [...] Social epistemology merely lifts the discipline [epistemology] from the intellectual life of the individual to that of the society, nation, or culture. (Shera, 1965, p. 27)

Shera spoke, rather vaguely, of a 'very important affinity between it [Social Epistemology] and librarianship' (Shera, 1970, p. 88) but then endorsed the strong

view that 'social epistemology can give librarianship its intellectual foundation for which we have been searching for so long' (Shera, 1970, p. 108). The result is that in Shera's writings there is a serious, unresolved tension between grounding librarianship in ESK as a sort of applied social epistemology (first quotation below) and defining librarianship as ESK *tout court* (second quotation below):

> What is librarianship? Basically, it <u>derives</u> from two disciplines. Certainly, it is an aspect of communication, and language, or linguistics is central to it. [...] But librarianship, as the management of knowledge is also <u>rooted</u> in epistemology–the knowledge of knowledge itself–and especially social epistemology, the way in which knowledge is disseminated through a society and influences group behavior. (Shera, 1961, p. 169)

> Librarianship is the management of human knowledge, the most interdisciplinary of all the disciplines–and because it is concerned with the philosophy of knowledge it is potentially the most deeply philosophical of all the professions. (Shera, 1965, p. 176, see also Shera, 1973)

According to Shera, theoretical LIS should address the philosophy of the philosophy of knowledge and become a sort of applied epistemology of social knowledge. Could this be right?

Simplifying, there are two approaches to ESK, one classic and the other revolutionary.[5] Neither seems to provide what is needed for the foundation of LIS. Classic ESK is an evolution of the Cartesian project in epistemology based on the search for truth and justification. It replaces the traditional, static frame of individual intelligence and stand-alone investigators with a new, more dynamic frame, based on distributed intelligence and multi-agents' epistemic or doxastic interactions. In this way, it enlarges the scope of its research to a wider variety of knowledge-related phenomena that were previously disregarded, such as testimony, trust and authority. Nevertheless, classic ESK is still veritistic. Its ultimate goal is still the discovery and justification of truth, and knowledge is still the only object of investigation. Information, not in its strict sense but understood as simply semantic content, or meaningful data, plays only a marginal role, if at all, in the research agenda.

Revolutionary ESK, on the other hand, adopts the new frame and, at least in its extreme version, uses it to criticize the Cartesian project and to argue that knowledge, truth and justification are social constructions. It comes closer to seeing information as the new fundamental object of its investigations, but when it does so, it is only in view of criticizing knowledge itself.

Both classic and revolutionary ESK are *prescriptive*. Their ultimate aim is to establish, for example, not what one believes about the stars, but what one should, and is justified to, believe about them. Both share in principle the same scope of investigation, namely the social dynamics of (allegedly, for the revolutionary brand) *epistemic* phenomena. All this is at the same time too much and too little to provide a satisfactory foundation for LIS. It is too much in terms of aim, because LIS can be normative but it does not and should not be epistemologically prescriptive. It is too little in terms of scope, because, as a consequence of its encyclopaedic vocation, LIS concerns a much wider variety of sources, from children's books to ancient astrological maps, from digital office records to sport videos. Such differences in aim and scope escaped Shera's analysis,[6] perhaps because of the too general meaning he attached to the concept of 'knowledge' in his most theoretical essays. They explain why any librarian will rightly be horrified by the methodological attitude flamboyantly expressed by Hume in *An Enquiry Concerning Human Understanding*:

> When we run over libraries, persuaded of these [epistemological] principles, what havoc must we make? If we take in our hand any volume of divinity or school metaphysics, for instance, let us ask, Does it contain any abstract reasoning concerning quantity or number? No. Does it contain any experimental reasoning concerning matter of fact and existence? No. Commit it then to the flames, for it can contain nothing but sophistry and illusion.

SE and LIS do not make a happy marriage because LIS works at a more fundamental level than epistemology. Its object is not knowledge itself but the information sources that make it possible, even if only indirectly. Thus, the online ALA Glossary defines Library Science as 'the professional knowledge and skill by which recorded information is selected, acquired, organized, and utilized in meeting the information demands and needs of a community of users'. (http://thorplus.lib.purdue.edu/engr/glossary.html also quoted in Stieg, 1992, who criticizes the lack of the 'humanistic side' of librarianship in this description.) And Borko (1968) argues that information science is:

> an interdisciplinary science that investigates the properties and behavior of information, the forces that govern the flow and use of information, and the techniques, both manual and mechanical, of processing information for optimal storage, retrieval and dissemination. (1968, p. 5)

To focus only on knowledge—whether to assess or criticize its possibility and nature—introduces an epistemological bias inconsistent with the real nature of LIS. Of course, anything can be used as a source of knowledge, at least because, reflexively, anything can be a source of knowledge about itself and its reference. However, this is exactly why LIS has a much wider scope than epistemology. It would be very misleading to conclude that LIS' object is therefore only the domain of organized knowledge itself, even if one adopts Shera's very liberal concept of knowledge.[7] This is probably why Kaplan, in the quotation given above, also speaks of 'culture'. In this way, one can avoid the epistemological fallacy.

LIS might have much to gain from a variety of socio-epistemological approaches. Both SE and LIS, however, seem in need of a more basic and conceptually less loaded foundation than the philosophy of knowledge itself. They both require a general *philosophy of information* (PI). SE has been for some time the philosophical field to which LIS could refer for its own theoretical needs, yet this should be seen as a second-best option. The closeness between LIS and SE is better understood if explained in terms of a common origin, as two branches of PI, rather than hierarchically. Time has come to have a closer look at PI itself.

3.   *What is the philosophy of information?*

Philosophers have recently begun to address the new intellectual challenges arising from the world of information and the information society.[8] Their computational and information-theoretic researches have become increasingly fertile and pervasive. The scientific revolution made 17th-century philosophers redirect their attention from the nature of the knowable object to the epistemic relation between it and the knowing subject, and hence from metaphysics to epistemology. The subsequent growth of the information society and the appearance of the infosphere (the semantic environment in which millions of people spend their time nowadays) have further influenced the development of contemporary philosophy. This has moved from focusing on the

domain represented by the memory and languages of organized knowledge—the instruments whereby the infosphere is managed—to focusing on the nature of its very fabric and essence, information itself. Information has thus arisen as a concept as fundamental and philosophically important as 'being', 'knowledge', 'life', 'intelligence', 'meaning' or 'moral good and evil'—all pivotal concepts with which it is interdependent—and so equally worthy of autonomous investigation. Information is a less 'thick' concept, in terms of which other richer concepts can be expressed and interrelated, when not defined.

The philosophy of information revitalizes old philosophical questions and poses, or rather identifies, new crucial problems. It also helps us to revise our world-view. Unsurprisingly, it has already produced a wealth of interesting and important results. But what is PI more specifically?

In general, a new area of philosophical research evolves into a well-defined field, possibly interdisciplinary but still autonomous, only if:

- it is able to appropriate an explicit, clear and precise interpretation of the classic 'what is x?' question, thus presenting itself as a specific 'philosophy of';
- the appropriated interpretation becomes an attractor towards which investigations in the new field can usefully converge;
- the attractor proves sufficiently influential to withstand centrifugal forces that may attempt to reduce the new field to other fields of research already well-established; and
- the new field is rich enough to be organized in clear sub-fields and hence allow for specialization.

Questions like: 'what is the nature of being?', 'what is the nature of knowledge?', 'what is the nature of right and wrong?', 'what is the nature of meaning?' are good examples of field-questions. They satisfy the previous conditions, and so they have guaranteed the stable existence of their corresponding disciplines: metaphysics or ontology, epistemology, ethics and philosophy of language. Other questions such as 'what is the nature of the mind?', 'what is the nature of beauty and taste?', or 'what is the nature of a logically valid inference?' have been subject to fundamental re-interpretations, which have led to profound transformations in the definition of philosophy of mind, aesthetics and logic. Still other questions, like 'what is the nature of complexity?', 'what is the nature of life?', 'what is the nature of signs?', 'what is the nature of control systems?' have turned out to be trans- rather than interdisciplinary. To the extent that the corresponding disciplines—Complexity theory, Philosophy of Life, Semiotics and Cybernetics—have failed to satisfy one or more of the previous conditions, they have struggled to establish themselves as academic, independent fields.

Does PI itself satisfy the above points? A first step towards a positive answer requires a further clarification that will be essential to understand the nature of LIS as well. Philosophy appropriates the 'what is x?' question essentially in two ways, *phenomenologically*[9] or *metatheoretically*. Philosophy of language and epistemology are two examples of 'phenomenologies' or philosophies of a phenomenon. Their subjects are meaning and knowledge, not linguistic theories or cognitive sciences. The philosophy of physics and the philosophy of social sciences, on the other hand, are clear instances of 'metatheories'. They investigate problems arising from organized systems of knowledge, which only in their turn investigate natural or human phenomena.

Some other philosophical branches, however, show only a *tension* towards the two poles, often combining phenomenological and metatheoretical interests. This is the case with philosophy of mathematics and philosophy of logic, for example. Like PI, their subjects are old, but they have acquired their salient features and become autonomous fields of investigation only very late in the history of thought. These philosophies show a tendency to work on specific classes of first-order phenomena, but they also examine these phenomena by starting from a metatheoretical interest in specific classes of second-order theoretical statements concerning those very same classes of phenomena, that is by relying on other sciences' methods and theories. The tension pulls each specific branch of philosophy towards one or the other pole. Philosophy of logic, to rely on the previous example, is metatheoretically biased. It shows a constant tendency to concentrate primarily on conceptual problems arising from logic understood as a specific mathematical theory of formally valid inferences, whereas it pays little attention to problems concerning logic as a natural phenomenon–what one may call, for want of a better description, rationality. Vice versa, PI, like philosophy of mathematics, is phenomenologically biased. It is primarily concerned with the whole domain of first-order phenomena represented by the world of information, computation and the information society, although it addresses its problems by starting from the vantage point represented by the methodologies and theories offered by information and communication sciences (ICS), and can be seen to incline towards a metatheoretical approach insofar as it is methodologically critical towards its own sources.

The following definition attempts to capture the clarifications introduced so far:

PI is the philosophical field concerned with (a) the critical investigation of the conceptual nature and basic principles of information, including its dynamics, utilization and sciences, and (b) the elaboration and application of information-theoretic and computational methodologies to philosophical problems.

Some clarifications are in order. The first half of the definition (PI.a) concerns philosophy of information as a new field. PI appropriates an explicit, clear and precise interpretation of the 'what is x?' question, namely 'what is the nature of information?' This is the clearest hallmark of a new field. Of course, as with any other field-questions, this too only serves to demarcate an area of research, not to map its specific problems in detail (see Floridi, 2001). PI provides critical investigations that are not to be confused with a quantitative theory of data communication (information theory).[10] On the whole, its task is not to develop a unified theory of information, but rather an integrated family of theories that analyse, evaluate and explain the various principles and concepts of information, their dynamics and utilization, with special attention to systemic issues arising from different contexts of application and the interconnections with other key concepts in philosophy, such as being, knowledge, truth, life or meaning. Recent surveys have shown no consensus on a single, unified definition of information.[11] This is hardly surprising. Information is such a powerful concept that, as an explicandum, it can be associated with several explanations, depending on the cluster of requirements and desiderata that orientate a theory. Claude Shannon, for example, remarked that

> The word 'information' has been given different meanings by various writers in the general field of information theory. It is likely that at least a number of these will prove sufficiently useful in certain applications to deserve further study and permanent recognition. *It is hardly to be expected that a single concept of information would satisfactorily account for the numerous possible applications of this general field.* (from 'The lattice theory of information', in Shannon, 1993, p. 180)

Polysemantic concepts such as information can be fruitfully investigated only in relation to well-specified contexts of use.

By 'dynamics of information' the definition refers to three things:

PI.a.i. *the constitution and modelling of information environments*, including their systemic properties, forms of interaction, internal developments etc.; PI.a.ii. *information life cycles*, i.e. the series of various stages in form and functional activity through which information can pass, from its initial occurrence to its final utilization and possible disappearance;[12] and PI.a.iii. *computation*, both in the Turing-machine sense of *algorithmic processing*, and in the wider sense of *information processing*.

PI.a.iii introduces a crucial specification. Although a very old concept, information has finally acquired the nature of a primary phenomenon only thanks to the sciences and technologies of computation and ICT (information and communication technologies). Computation has therefore attracted much philosophical attention in recent years. Nevertheless, PI privileges 'information' over 'computation' as the pivotal topic of the new field because it analyses the latter as presupposing the former. PI treats 'computation' as only one of the processes in which information can be involved. Thus, the field should be interpreted as a philosophy of information rather than just of computation, in the same sense in which epistemology is the philosophy of knowledge, not just of perception.

From an environmental perspective, PI is prescriptive about, and legislates on, what may count as information, and how information should be adequately created, processed, managed and used. However, PI's phenomenological bias does not mean that it fails to provide critical feedback. On the contrary, methodological and theoretical choices in ICS are also profoundly influenced by the kind of PI a researcher adopts more or less consciously. It is therefore essential to stress that PI critically evaluates, shapes and sharpens the conceptual, methodological and theoretical basis of ICS, in short that it also provides a *philosophy of ICS*, as this has been plain since early work in the area of philosophy of AI (Colburn, 2000).

It is worth stressing here that an excessive concern with the metatheoretical aspects of PI may lead one to miss the important fact that it is perfectly legitimate to speak of PI even in authors who lived centuries before the information revolution, and hence that it will be extremely fruitful to develop a historical approach and trace PI's diachronic evolution, as long as the technical and conceptual frameworks of ICS are not anachronistically applied, but are used to provide the conceptual method and privileged perspective to evaluate in full reflections that were developed on the nature, dynamics and utilization of information before the digital revolution (consider for example Plato's *Phaedrus*, Descartes' *Meditations*, Nietzsche's *On the Use and Disadvantage of History for Life*, or Popper's conception of a third world). This is significantly comparable with the development undergone by other philosophical fields like philosophy of language, philosophy of biology, or philosophy of mathematics.

The second half of the definition PI.b indicates that PI is not only a new field, but provides an innovative methodology as well. Research into the conceptual nature of information, its dynamics and utilization is carried on from the vantage point represented by the methodologies and theories offered by ICS and ICT (see, for example, Grim *et al*. 1998). This perspective affects other philosophical topics as well. Information-theoretic and computational methods, concepts, tools and techniques have already been developed and applied in many philosophical areas:

- to extend our understanding of the cognitive and linguistic abilities of humans and animals and the possibility of artificial forms of intelligence (philosophy of AI; information-theoretic semantics; information-theoretic epistemology; dynamic semantics);
- to analyse inferential and computational processes (philosophy of computing; philosophy of computer science; information-flow logic; situation logic);
- to explain the organizational principles of life and agency (philosophy of artificial life; cybernetics and philosophy of automata; decision and game theory);
- to devise new approaches to modelling physical and conceptual systems (formal ontology; theory of information systems; philosophy of virtual reality);
- to formulate the methodology of scientific knowledge (model-based philosophy of science; computational methodologies in philosophy of science);
- to investigate ethical problems (computer and information ethics; artificial ethics), aesthetic issues (digital multimedia/hypermedia theory; hypertext theory and literary criticism) and psychological, anthropological and social phenomena characterizing the information society and human behaviour in digital environments (cyberphilosophy).

Indeed, the presence of these branches shows that PI satisfies criterion iv. As a new field, it provides a unified and cohesive theoretical framework that allows further specialization.

PI possesses one of the most powerful conceptual vocabularies ever devised in philosophy. This is because we can rely on informational concepts whenever a complete understanding of some series of events is unavailable or unnecessary for providing an explanation. In philosophy, virtually any issue can be rephrased in informational terms. This semantic power is a great advantage of PI understood as a methodology (see PI.b). It shows that we are dealing with an influential paradigm, describable in terms of an informational philosophy. But it may also be a problem, because a metaphorically 'pan-informational' approach can lead to a dangerous *equivocation*, namely thinking that since anything can be described in (more or less metaphorically) informational terms, then everything has a genuinely informational nature. The equivocation is clear if one considers, for example, the difference between modelling the production chain that links authors, publishers and librarians as an information process, and representing digestion *as if* it were an information process. The equivocation obscures PI's specificity as a philosophical field with its own subject. In particular, PI runs the risk of becoming synonymous with philosophy and become a sort of 'everythingism'. And if we are not careful, this can badly damage our efforts in the next section to define LIS as applied PI.

The best way of avoiding this loss of identity and specificity in PI and consequently in LIS is to concentrate on the first half of the definition. PI as a philosophical discipline is defined by what a problem is (or can be reduced to be) *about*, not by *how* a problem can be formulated. Although many philosophical issues seem to benefit greatly from an informational analysis, in PI information theory provides a literal foundation, not just a metaphorical superstructure. PI presupposes that a problem or an explanation can genuinely and legitimately be reduced to an informational problem or explanation. Therefore, the criterion to test the soundness of the informational analysis of x is not to check whether that x *can* be formulated, shaped or presented in information terms but to ask what would it be like for x not to have an informational nature at all.[13]

4.   *Library and information science as applied philosophy of information*

Now that we have a clearer idea of what PI is, we can combine the analyses developed in the previous two sections and concentrate on the advantages of defining LIS as applied PI.

PI presents itself also as a philosophy of LIS. This means that LIS could be interpreted as applied PI and that the latter could replace SE entirely as LIS' theoretical foundation. This hypothesis has recently been supported by Herold (2001):

> 'To the extent that librarianship is an applied philosophy of information, it seeks to discover the roots of phases of information dynamics in the course of our traditional work. Together with research beyond librarianship, our goal has ever been the design and functioning of effective information services. Investigation of the nature of information should reveal characteristics and properties that serve to better our understanding of its relationships with other types of things. The results of such efforts should enhance the many avenues of existing practice and at least take expression in these familiar terms'.

Is PI a viable alternative to SE as a foundation of LIS? To see that it is, let us review the four variables of approach, level, object and scope of research and goal:

- like PI, LIS accepts the post-Cartesian approach represented by the dynamic frame of distributed intelligence and multi-agents' interactions;
- like PI, LIS is not purely metatheoretical but has a phenomenologically-biased level of investigation and a holistic and encyclopaedic scope. There is no specific or unique theory, science or other body of knowledge studied by LIS (if there were, this would simply deny the obvious encyclopaedic stance of LIS). Are we then to conclude that LIS is a purely *phenomenological* science, in the sense seen above? Of course not. LIS does have an intrinsic vocation to look at its objects from a second-order level. The fact is that LIS shares with PI a tension between the two perspectives, and should not be merely reduced to one or the other;
- LIS' object of research is information not in the strong, technical sense of well-formed, meaningful and truthful data (Floridi, forthcoming), but in the weaker and more specific sense of recorded data or *documents*.[14] Archibald MacLeish, cited by Gorman (2000, p. 18), speaks brilliantly of 'the library's implicit assertion of the immanence of meaning'. LIS does not cover all PI's ground, but is concerned more specifically with documents' life cycles;
- once it is based on PI, LIS can be normative about what should count as its objects and how its objects should be handled, without running the risk of being epistemologically prescriptive.

The following definition attempts to capture the clarifications introduced so far:

(LIS) Library and Information Science as Applied Philosophy of Information is the discipline concerned with documents, their life cycles and the procedures, techniques and devices by which these are implemented, managed and regulated. LIS applies the fundamental principles and general techniques of PI to solve definite, practical problems and deal with specific, concrete phenomena. In turn, it conducts empirical research for practical service-oriented purposes (e.g. conservation, valorization, education, research, communication and co-operation), thus contributing to the development of basic research in PI.

5. *Conclusion: a historical challenge and opportunity*

LIS has been debating its theoretical foundation and academic status at least since the 1930s, when the Chicago Graduate Library School began.[15] As Ostler and Dahlin (1995) have stressed, this long crisis, triggered by a pragmatic approach, represents a theoretical challenge and a historical opportunity, especially in the information society:

> Dewey's pragmatic approach leaves us without the theoretical tools that are necessary to deal with the problem of the Information Age (p. 683) [. . .] the library profession is experiencing a paradigm shift, a major change in the way that librarians do their work. [. . .] The positive side of this crisis of confidence is that it provides a wonderful opportunity to reconsider the foundation of our profession and professional library education. (p. 684).

Unfortunately, many past attempts to take advantage of this opportunity appear to have moved in the wrong direction. Researchers have been lured by a variety of friendly but pre-established philosophies instead of fighting for their own place in the philosophical field. Thus, Zwadlo (1997) has noted that, for librarianship:

> obtaining a philosophy is something like borrowing a book from our libraries. But, like the borrowed books, the borrowed philosophies do not really belong to us, always seem to need to be renewed, and we end up returning them, only to borrow others. (p. 105).

Sometimes this 'borrowing process' between LIS and philosophy has been mediated by SE itself and its interdisciplinary methodology (Shera, 1970 is a good example). In any case, the result has been, in the words of Pierce (1992), a sort of intellectual ghetto:

> Our field imports theory from communications, education, linguistics, management, psychology, sociology, and a host of other disciplines. How odd. Not many other disciplines accept dissertations grounded in the intellectual traditions of other fields. This research is less interdisciplinary than what might be called 'out-disciplinary'. Such research seeks theoretical foundation in other disciplines, rather than using selective importation to enrich our own. We live in a kind of intellectual ghetto; our most talented researchers seek favor by imitating practices of disciplines considered superior to our own. (p. 641) We have paid so little attention to our own intellectual history that we may have to reconstruct it—almost from scratch. (p. 643).

Yet, the historical opportunity remains. The foundationalist debate has lasted for so long because LIS was looking for something that was not yet available, namely PI. As a new research area that has only very recently become a recognizable academic field, PI can indicate the direction to take, but much groundwork still needs to be done and LIS can provide an essential contribution.

   PI attempts to expand the frontier of philosophical research. It does so not by putting together pre-existing topics, and thus re-ordering the philosophical scenario, but by enclosing new areas of philosophical inquiry—that have been struggling to be recognized and have not yet found room in the traditional philosophical syllabus—and by providing innovative methodologies to address traditional problems from new perspectives. Understood as a foundational philosophy of information analysis and design, PI can explain and guide the purposeful construction of our intellectual environment, and provide the systematic treatment of the conceptual foundations of contemporary society. It enables humanity to make sense of the world and construct it responsibly, a new stage in the semanticization of being. Insofar as PI satisfies the role of a theoretical foundation of LIS, it provides a systematic understanding of the basic concepts related to library and information science, by studying the nature,

value and goals of practices in librarianship. The philosophy of librarianship has often been looking for some external source of theoretical support, outside its real scope. By contributing to the development of PI, LIS can carry on the task of developing its own theoretical foundation from within. This is a good sign that we might finally have taken the right approach.

Acknowledgement

Notes

1. The reader who wishes to know more about PI, its origins, scope and problems, is referred to Floridi (1999b, 2002b, forthcoming, and especially 2001 and 2002a).
2. Nitecki (1993) and (1995) provides a detailed and informative review of the extended literature on the philosophy of librarianship.
3. Primary literature relevant to the contents of this paper includes Bloor (1976), Fuller (1996), Goldman (1987, 1999) and Kitcher (1994).
4. See, for example, Ortega (1934, 1935) and Floridi (1999a) for a general approach to information ethics.
5. See Goldman (2000) for an updated and lucid review of the field, with further bibliographical information.
6. This is clear, for example, in Shera (1965, chapters 1–3; 1970, chapter F).
7. See, for example, Shera (1961, 1965, chapter 2; 1970, esp. p. 92).
8. See Bynum and Moor (1998), Colburn (2000), Floridi (1999b, 2002) and Mitcham and Huning (1986) for references.
9. The word is used here in its general meaning, to refer to the conceptual investigation of a related group of phenomena. It should not be confused with Husserl's or Heidegger's senses of *phenomenology*.
10. On the problematic connection between LIS and information theory understood as the mathematical theory of communication, see Neill (1992).
11. For some reviews of the variety of meanings and the corresponding different theoretical positions, see Floridi (forthcoming), where I have investigated and supported the definition of semantic information as meaningful and truthful, well-formed data.
12. A typical life cycle includes the following phases: occurring (discovering, designing, authoring, acquiring, creating, etc.), processing and managing (collecting, validating, modifying, organizing, indexing, classifying, filtering, updating, sorting, storing, networking, distributing, disseminating, displaying, accessing, retrieving, transmitting, transferring, etc.) and using (monitoring, modelling, analysing, explaining, interpreting, planning, forecasting, decision-making, instructing, educating, learning, etc.).
13. With this criterion in mind, I have provided a sample of some open questions in PI in Floridi (2001).
14. The concept of 'document' has been subject to several analyses, for a review see Buckland (1997). Floridi (1999b) analyses documents as recorded data.
15. See, for example, Hjørland (2000) for a recent review of various attempts and positions.

References

BLOOR, D., 1976, *Knowledge and Social Imagery* (London: Routledge & Kegan Paul).
BORKO, H., 1968, Information science: what is it? *American Documentation*, 19, 3–5.
BUCKLAND, M. K., 1997, What is a 'document'? *Journal of the American Society for Information Science*, 48, 804–809. Available online: http://www.sims.berkeley.edu/~buckland/whatdoc.html
BYNUM, T. W. and MOOR, J. H., (eds), 1998, *The Digital Phoenix: How Computers are Changing Philosophy* (Oxford: Blackwell).
COLBURN, T. R., 2000, *Philosophy and Computer Science* (Armonk, NY & London: M.E. Sharpe).
FLORIDI, L., 1999a, Information ethics: on the theoretical foundations of computer ethics. *Ethics and Information Technology*, 1, 37–56. Preprint available online: http://www.wolfson.ox.ac.uk/~floridi/pdf/ieotfce.pdf

FLORIDI, L., 1999b, *Philosophy and Computing–An Introduction* (London & New York: Routledge).
FLORIDI, L., 2001, Open problems in the philosophy of information, *The Herbert A. Simon Lecture on Computing and Philosophy*, Carnegie Mellon University, 10 August 2001. Conference available as realvideo online: http://ethics.acusd.edu/video/CAP/CMU2001/Floridi/index.html
FLORIDI, L., 2002a, What is the philosophy of information? forthcoming in *Metaphilosophy*. Preprint available online: http://www.wolfson.ox.ac.uk/~floridi/pdf/wipi.pdf
FLORIDI, L., (ed.), 2002b, *The Blackwell Guide to the Philosophy of Computing and Information* (New York & Oxford: Blackwell).
FLORIDI, L., forthcoming, Is information meaningful data? Preprint available online: http://www.wolfson.ox.ac.uk/~floridi/pdf/iimd.pdf
FULLER, S., 1996, Recent work in social epistemology. *American Philosophical Quarterly*, 33, 149–166.
GOLDMAN, A., 1987, Foundations of social epistemics. *Synthese*, 73, 109–144.
GOLDMAN, A., 1999, *Knowledge in a Social World* (New York: Oxford University Press).
GOLDMAN, A., 2000, Social epistemology. In E. N. Zalta (ed.) *Stanford Encyclopaedia of Philosophy* (The Metaphysics Research Lab Center for the Study of Language and Information, Stanford University, http://plato.stanford.edu/)
GORMAN, M., 2000, *Our Enduring Values–Librarianship in the 21st Century* (Chicago: American Library Association).
GRIM, P., MAR, G. and ST. DENIS, P., 1998, *The Philosophical Computer* (Cambridge MA: MIT Press).
HEROLD, K. R., 2001, Librarianship and the philosophy of information. *Library Philosophy and Practice*, 3. Available online: http://www.uidaho.edu/~mbolin/herold.html
HJØRLAND, B., 2000, Library and information science: practice, theory, and philosophical basis. *Information Processing and Management*, 36, 501–531.
KAPLAN, A., 1965, The age of the symbol. In D. R. Swanson (ed.) *The Intellectual Foundations of Library Education* (Chicago: University of Chicago Press), pp. 7–16.
KITCHER, P., 1994, Contrasting conceptions of social epistemology. In F. Schmitt (ed.) *Socializing Epistemology* (Lanham, MD: Rowman and Littlefield), pp. 111–134.
MITCHAM, C. and HUNING, A. (eds), 1986, *Philosophy and Technology II–Information Technology and Computers in Theory and Practice* (Dordrecht & Boston: Reidel).
NEILL, S. D., 1992, *Dilemmas in the Study of Information: Exploring the Boundaries of Information Science* (New York: Greenwood Press).
NITECKI, J. Z., 1993, *Metalibrarianship: A Model for Intellectual Foundations of Library Information Science*, vol. 1 of *The Nitecki Trilogy*. Available online: http://www.du.edu/LIS/collab/library/nitecki/
NITECKI, J. Z., 1995, *Philosophical Aspects of Library Information Science in Retrospect*, vol. 2 of *The Nitecki Trilogy*. Available online: http://www.du.edu/LIS/collab/library/nitecki/
ORTEGA, J. y G., 1934, The mission of the librarian. *Antioch Review*, 21, Summer 1961, 133–154; also: Mission du bibliothécaire. *Archives Bibliothèques et Musees de Belgique*, 2, 65–86.
ORTEGA, J. y G., 1935. Man must tame the book. Address delivered in May. *Wilson Bulletin for Librarians*, 10, January 1936.
OSTLER, L. J. and DAHLIN, T. C., 1995, Library education: setting or rising sun?. *American Libraries*, 26, 683–684.
PIERCE, S., 1992, Dead Germans and the theory of librarianship. *American Libraries*, 23, 641–643.
RAWSKI, C. H. (ed.), 1973, *Toward a Theory of Librarianship: Papers in Honor of Jesse Hauk Shera* (Metuchen, NJ: Scarecrow Press).
SHANNON, C. E., 1993, *Collected Papers*, N.J.A. Sloane and A.D. Wyner (eds) (Los Alamos, Ca: IEEE Computer Society Press).
SHERA, J. H., 1961, What is librarianship? *Louisiana Library Association Bulletin*, 24, Fall 1961, 95–97; rep. in *American Library Philosophy–An Anthology*, B. McCrimmon Hamden (ed.), Conn. Shoe String, 1975, 165–171.
SHERA, J. H., 1965, *Libraries and the Organization of Knowledge*, D.J. Foskett (ed.) (Hamden, Conn.: Archon Books).
SHERA, J. H., 1970, *Sociological Foundations of Librarianship* (London: Asia Publishing House).
SHERA, J. H., 1973, *Knowing Books and Men: Knowing Computers Too* (Littleton, Colo.: Libraries Unlimited).
STIEG, M. F., 1992, *Change and Challenge in Library and Information Science Education* (Chicago: American Library Association).
WRIGHT, H. C., 1977, *Oral Antecedents of Greek Librarianship* (Provo, Utah: Brigham Young University Press).
ZWADLO, J., 1997, We don't need a philosophy of library and information science–we're confused enough already. *The Library Quarterly*, 67, 103–105.