Core competencies in information management education

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Keywords

Librarians, Education, Curriculum, Information systems, Information management

Abstract

Core competencies have long been discussed and developed in the literature of library science education and information systems education. However, for information management, a blending of these two disciplines, there has been much less discussion of core competencies. The purpose of this paper is to consolidate the sparse literature on information management educational competencies and to suggest a set of core competencies and educational outcomes that might be applied to curricula in both developed and developing countries.

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Introduction

Library science (or library and information science (LIS)) has a long history of academic interest; this is reflected in the many programmes of study and the rich research literature that has developed in the last century. Information systems (IS), however, is much younger and reflects the technical edge given to information with the development of computers after 1945 and the increased research into digitisation and its subsequent applications. Information systems emerged in the late 1960s simultaneously from accounting and the fledgling computer science disciplines.

This divergence and development reflects the continued emergence of offshoots of the original disciplines, with the result that today students and those interested in the way information is developed, created, catalogued, managed, and used are confronted with a range of titles ranging from the most recent, "Information Architecture", to the oldest, "Librarianship". This development is reflected in Figure 1. However, we are more concerned in this paper with the information management (IM) perspective, as this currently appears to be the strongest of the hybrid forms of information studies that has emerged from the two original disciplines.

We are writing this paper from that perspective, being, respectively at the time of writing, professors of library and information management and information systems in a single school at Victoria University of Wellington (VUW). Until 1998 VUW had separate departments of Library Studies and Information Systems, the latter of which had itself developed out of the Department of Accounting in 1989. The two groups were amalgamated in 1998, bringing together two different perspectives on information and two sets of competencies in the professional applications of those competencies. Over the ensuing five years each discipline has consolidated and strengthened its own perspectives but in 2000 faced a challenge of how to utilise better the skill set and academic knowledge within the two disciplines at a post-graduate level. The result was the development and implementation of a master's degree in information management, as this seemed the best titular vehicle to represent the nature of what both disciplines

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Figure 1 Schematic diagram of disciplinary development in information studies
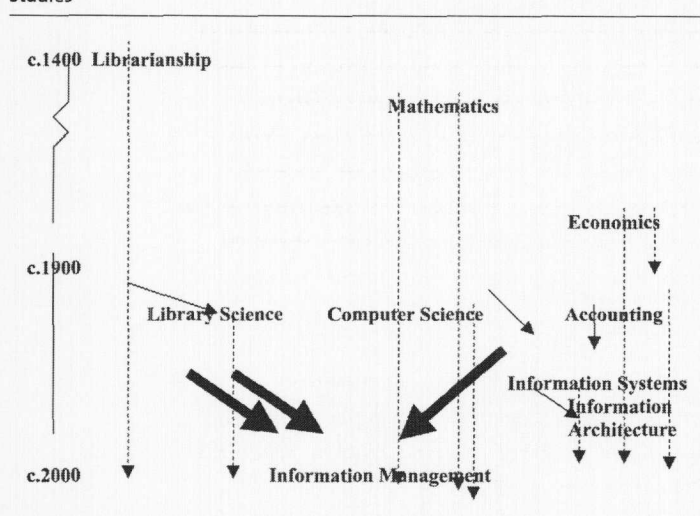
were trying to do. However, the basis of that decision was essentially a pragmatic one as, whilst the discrete competency sets of the two disciplines was clear, the amalgamated competency set that would be generated by a degree in IM was not.

Competencies frame what the professional librarian, library scientist and information systems analyst do. Both LIS and IS relate to specific occupations. The nature of what is taught in each discipline reflects what the respective professions require of their members. These are the competencies. In developing new programmes in IM we all need to reflect on what the competency set is that we develop as a result.

A classic understanding of competency is the generic knowledge, skill or attitude of a person that is related to effective behaviour as demonstrated through performance (Griffiths and King, 1985). In our view core competencies are an essential component in understanding the evolution of a profession and, educationally, in developing responsible professional education programmes. As educators, we believe that competencies provide an objective framework for the design and validation of professional education programmes. Beyond that, they also perform a range of useful functions:

- They provide guidelines for determining programme entry and graduation levels.
- They provide a framework for programme evaluation.
- They provide a base for manpower planning and development (Rehman *et al.*, 1997, p. 163).

Competencies can be viewed in terms of a knowledge base and of skills appropriation that follows from those competencies. The knowledge base, as distinct from the skills appropriation that comes with professional practice, is the focus of this paper.

It should be stated at the outset, however, that core competencies once defined cannot be taken as either universal or immutable. They are constantly evolving, as they should be in order to remain relevant, and they are also dependent on the context in which they are applied – it is possible that core competencies applied in Britain may not be relevant in Cambodia; they may be a "wish list" for the latter rather than a reflection of current developments. In this paper we are addressing core competencies in the fields of LIS, IS and IM as reflected in Australian and New Zealand higher education and professional practice.

Core competencies in LIS

Background

In the present context we define library science as "a generic term for the study of libraries and information units, the role they play in society, their various component routines and processes, and their history and future development" (Prytherch, 2000, p. 449). We do not use "librarianship" for a variety of reasons, one being that it is no longer much in favour and another being its more limited reflection of a somewhat static profession. Library science is what most of us profess, as we are engaged in the study of information services, their role, their components and routines, etc. It is a dynamic rather than a static field; as Apostle and Raymond (1987, p. 17) pointed out in the 1980s:

> In the last two decades new communications and computer-based technologies have produced profound changes in many occupations. This is especially true for the library profession where the impact of these technologies has been felt in day-to-day internal library operations, in interlibrary network arrangements, in content of education for librarianship and, finally, in the profession's self-perception.

It is the aspect of self-perception that is apposite in the present context, for much of what we are addressing reflects the evolving self-perception of library professionals and information systems professionals from one

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disciplinary background into another one, that of information management.

In the 1980s "librarianship" was still being used as the principal designation for our profession in many places. By the beginning of the 1990s new ICTs and ITs were appearing at such a phenomenal rate that "profound changes" would have seemed a rather mild description for the lightening speed at which IT-driven developments were sweeping through the library profession. In those years "library and information science" or just "library science" self-consciously supplanted "librarianship" as the preferred term, certainly among the schools devoted to education in this field. In our view this was a recognition that the profession has moved out of its home in the humanities and possibly the "softer" social sciences into a more technologically aware and "harder" field allied with management, information systems, computer science, etc. It had become a "real" social science.

This is not the place to offer case studies of core competencies over the decades, showing how they have evolved from humanities-based approaches common to history, literature, philosophy to social sciences-based approaches exemplified by economics, management science, sociology, etc. Suffice it to say that in our considered opinion this is what has happened, and the "traditional" curriculum and core competencies now reside in what is defined as LIS.

The core competencies in LIS
These core competencies take many forms, as a brief survey of the literature indicates. The New Jersey Library Association, for instance, divides competencies into professional and personal, with eight divisions under the former (e.g. customer service, administration) and seven under the latter (e.g. flexibility, communication) (New Jersey Library Association, Professional Development Committee, Core Competencies *Ad Hoc* Committee, 1999). In contrast, some Australian work has been done on much broader sets of competencies compressed into three "streams": working with clients, working with information, working with others, each with a series of fields and sub-fields (Thurstans, 1995). Similarly, Moore *et al.* (1998) in their work for UNESCO devised a set of four competency areas, termed "creators", "collectors",

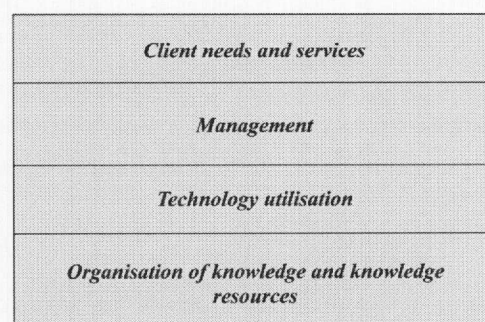"communicators" and "consolidators". Several other studies have tended to use fewer rather than more sets of core competencies.

In keeping with this trend towards "less is more", for our model of core competencies we have devised a set of four areas that encompass the basic knowledge base of present-day library science professionals: client needs and services, management of people and resources, technology utilisation, organisation of knowledge. These core competencies can be visualised as a column (see Figure 2), with the organisation of knowledge as the underlying principle, and the client as the pinnacle towards which all knowledge is directed.

The most basic core competency, organisation of knowledge and knowledge resources includes not only the intellectual process of knowledge organisation but also the activity of resource collection. It deals with recorded information and in particular how we identify, select and acquire recorded information in all formats and organise, describe, and provide access to recorded information in all formats. Competence in organising collections of information resources involves thorough knowledge of bibliographic and intellectual control principles and standards, understanding of how to apply these principles and standards in practical, cost-effective operations and the ability to collaborate with those who provide systems for managing organisational functions such as library vendors and information technologists. To facilitate the use of information resources the competent information professional employs a broad range of organising methods:
- cataloguing;
- indexing;
- classification;
- metadata.

Figure 2 The hierarchy of competencies in LIS

| Client needs and services |
| Management |
| Technology utilisation |
| Organisation of knowledge and knowledge resources |

Accordingly, the competent information professional should be able to:

- Describe the principles and apply the methods of organising information, such as cataloguing, classifying, indexing, abstracting and metadata.
- Develop alternative tools to help users manage their specific information needs.
- Evaluate the effectiveness of systems of organisation used in information resource settings.
- Connect users with appropriate information.
- Demonstrate understanding of information seeking behaviour and appropriate responses.
- Demonstrate knowledge of information sources.
- Evaluate the quality and appropriateness of information.
- Demonstrate understanding of the information creation, dissemination and use cycle.
- Demonstrate understanding of the effects of information and information dissemination on society and organisational structures.
- Demonstrate understanding of the changing information environment, e.g. economics, publishing, media, etc.
- Demonstrate understanding of the effects of the changing information environment on the profession.
- Synthesise disparate information sources to satisfy user needs.
- Demonstrate understanding of information retrieval techniques and their appropriate use.
- Select appropriate information resources and formats to satisfy the information needs of diverse populations and to meet user needs most effectively given economic constraints.
- Demonstrate understanding of the issues and techniques associated with the preservation and conservation of information.

The next two broad core competencies, technology and management, are the means whereby the organisation of knowledge is facilitated and focused on clients' needs. In the core competency of technology utilisation the knowledge base should enable one to employ appropriate technologies in library and information applications, and understand emerging trends in technology and appreciate how these might impact on the information profession. For information professionals, technology is now a principal means whereby information is handled, managed and transmitted. Technology utilisation in the LIS curriculum focuses principally on the information-related applications of the technology, and on the managerial, social and higher level aspects of technology use (Khoo and Al-Hawamdeh, 2000). Therefore, technology utilisation as a core competency encompasses the following skills or abilities:

- Demonstrate understanding of the nomenclature, principles and application of electronic information handling hardware and software.
- Describe how and why electronic information technologies have affected library services.
- Demonstrate proficiency in creating accessible Web-based information resources using contemporary techniques and following relevant guidelines.
- Demonstrate the ability to scan the environment for technological trends relevant to library and information services.
- Demonstrate knowledge of relevant technical standards and standard-setting bodies.
- Read with comprehension functional and evaluative descriptions of advanced and emerging technologies.
- Demonstrate proficiency in evaluating technology products for their appropriate application.
- Demonstrate ability to assess the economic and service benefits derived from the application of technology to library and information services.

It has to be said, however, that we are perhaps, like our colleagues elsewhere, showing signs of age in singling out technology utilisation in this manner. For those who have grown up with IT, it is not something separate or unique. Rather, technology is applied across the spectrum of professional practice; it infuses everything that we do and so does not deserve to be treated as a distinct entity or competency set. The late Douglas Adams put our concern very well, and in one address he variously referred to technology as "our word for stuff that doesn't work yet" and "our word for stuff we

don't understand" (Cassell, 2000). We do not actually believe that either is appropriate in our field and hope that someone might devise categories in which technology and its utilisation are fully integrated into a set of functional competencies. In our view that has not yet been achieved.

The third core competency, management, is the ideal accompaniment for technology utilisation because it focuses on the human component of not only the technology but also the range of processes related to knowledge and client use of knowledge resources. In this competency focus is on how to apply contemporary management principles in practical and productive ways, and on understanding the need to balance physical, human, financial and client resources. It includes not only specific managerial activities aimed at making the most of human and technological resources, but also the broad managerial application of research. Research assists in the establishment of future directions of the information profession and in the creation and refinement of practice. It plays an important role in policy development, planning and the decision-making process. Research also allows the demonstration of need to administrators, funding agencies and other institutions in and outside the information profession. A basic and demonstrable knowledge of the research process is important for all information professionals. Knowledge of the research process and the accompanying critical thinking skills are essential, and this knowledge allows one to understand the framework in which research occurs. Some of the principal skills of this competency are:

- Lead effective strategic and operational planning, evaluation, and marketing processes.
- Employ ethical and legal decision-making.
- Develop and implement essential information policies and procedures.
- Practice effective human resource management.
- Inspire, motivate, and guide others toward goal accomplishment.
- Demonstrate proficiency in effective interpersonal communication techniques.
- Operate successfully in a team environment in flexible and creative organisation structures.

- Foster collaborative community-based partnerships and networks.
- Promote an environment that embraces multicultural and bicultural diversity.
- Evaluate the validity of research studies and methodologies.
- Design appropriate research studies.
- Use data-based decision-making and problem solving.

All of this is aimed at supporting the clients who are the focus of the user-oriented tradition characteristic of LIS. "While LIS curriculum continues to incorporate perspectives from other disciplines, a unique core has taken shape that is predominantly user-centered" (Durrance, 2000). Thus either the pinnacle or driving competency in LIS education is the client, or what we term client needs and services. In this area of essential knowledge, client needs include identifying the needs of particular client groups and also developing collections and services to meet client needs. In the latter area there is a clear overlap with the organisation of knowledge and knowledge resource competency. This over-arching knowledge base includes as its skills the significant new area of learning facilitation or information literacy, as well as the more traditional areas of client-centred service, client needs, reference service, etc. A partial listing of the specific skills related to client needs and services is:

- Maintain a positive environment.
- Demonstrate a clear commitment to client-centred service.
- Analyse and evaluate the diverse needs of clients for the purpose of adapting and improving service.
- Practice effective interviewing skills to best determine client needs.
- Listen and respond to information requests in a manner that encourages further client enquiry.
- Act as a user advocate during the development of information products and systems.
- Provide instruction in basic information gathering and research skills, including how to use and evaluate information sources.
- Develop and implement an effective means of communicating the value of information literacy, and of providing for the facilitation of learning.

- Demonstrate proficiency in examining the local and global information. environments for societal changes and service opportunities.
- Apply different learning theories and methodologies.
- Assess learning needs.
- Design and develop educational/ instruction programs appropriate to the identified needs.
- Select appropriate delivery methods.
- Demonstrate effective presentation skills using appropriate technologies.
- Continuously evaluate learning and revise programs as appropriate.

Core competencies in IS

Background

Information systems is frequently defined as the study of the application of computers to business problems. However, in a tighter epistemology it is a discipline distinguished by the notion of representation and ontology. (Webber, 1989, 1997, 1999, 2001; Webber and Wand, 1990, 1995; Webber and Zhang, 1996; Webber and Colomb, 1998) Representation of information occurs in various forms, conceptualisations and interpretations. IS produces representations of a real world of information and knowledge in forms that are visually, textually and graphically coherent in their application to business and non-business organisations.

In seeking to understand the skill set of competencies that any information systems professional will have in determining and enabling these representations of information and knowledge, there is some sense in finding a common set of activity for the IS professional. A detailed literature search on the topic of competency in IS shows surprisingly little documentation, but enough to develop a notional list which might enthuse others to refine and develop the set of competencies further. As stated earlier, the purpose of this paper is to utilise competencies allied to LIS and IS to try to establish some understanding of a competency set for IM.

The core competencies in IS

The competencies for IS cover a range of methodologies. However, our task is not to focus on those but rather to establish what the

competency set might be. The first set of skills or competencies is rather obvious. The technology applications competency forms the foundation of IS and the representations that emerge. In some sense technology application competency is related to the competencies of the complementary set associated with computing in general. It requires an understanding of the nature of technology, the means to make the technology work, and the methodologies that create usable representations of information.

The second competency relates to information architecture and structure and the ways information is represented as it is transformed from data to information to knowledge. This requires a detailed understanding of the architecture of information representation. Data need to be modelled and organised in ways that reduce the information overload associated with the inherent complexity and abundance of data. The use of the Internet as a fundamental technological competency in IS has created a world where sources of data and information are complex and abundant. Without establishing architectures to modify, codify and reduce information to a level where its utility can emerge, the information remains less useful. Information systems is concerned with how best to utilise the 1,500,000,000 Websites in their application to business processes, business strategy, information architecture for business and for most effective means of mining useful data and information from the abundance of Web-based information. Such architectures are created by technologies and utilise the concepts of systems methodologies to create usable and coherent representations, and they must be built on the skills set of technology competency relevant in IS.

In IS these architectures require detailed understanding of availability, storage, security and protection, and continuity. Databases form the fundamental architectures of IS practitioners. Their competency in storing, protecting, mining and continuing those databases is essential if the architecture is to support the other competencies necessary for IS practice.

The third competency is information mastery. This competency emerges from technological skills and enables the user of IS methodologies to coalesce information in ways that demonstrate an ability to create and

use meaning in that information as it is transformed into knowledge. High level decision support systems, expert systems and data warehouses enable IS practitioners to scramble from the mire of diffuse and disorganised information to master that information and transform it into value added information for application in business and government decision resolution, planning or strategy development and implementation. Such mastery relies on both practice and the need to grow skill and knowledge creation through research and experimentation.

The fourth competency relates to information and knowledge management. Business uses information as a means of enabling decision-making, planning, developing strategy, customising process and control, of engaging in negotiations; resolving issue and conflict resolution; organisational and leadership management. To manage and make effective decisions depends on the competencies discussed above. Without mastery, without architectures and without technologies, there is a limited framework for information and knowledge use to be set within a framework that enables business and government leaders to make efficient use of information for decision-making. This is the ultimate use of information, as it drives the outcomes created in the organisational context. Specific competencies here include:
- expanding customers and markets;
- building customer relationships through improved customer service and information exchange;
- improving supply chain integration to reduce input costs and improve information exchanges with suppliers.

Within this competency of management skills is the necessity to promote, utilise and create clear pathways for information flow, for effective use of information architectures and for effective outcomes from business decisions. Communication skills and associated competencies are necessary and an integral part of the competency set of knowledge management for IS. Such competencies should include understanding team/group dynamics; utilising new methods of communication and information sharing; incorporating participation and collaboration; and learning to think "systems".
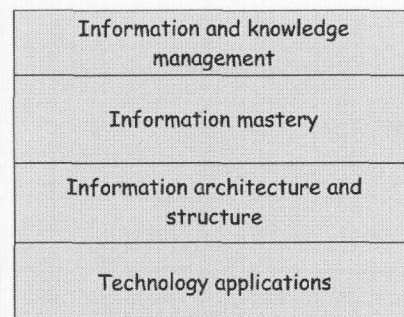
Information systems competencies are interdependent but still rely on those other sets of competencies which are considered more fundamental than the set being developed. This representation is shown in Figure 3. The most basic set of competencies are the technical application competencies upon which the IS professional develops structures and architectures with data, masters and then manages information and knowledge.

Competencies in information – another perspective

In a recent monograph Abell and Oxbrow (2001) use research and case studies to build a set of competencies which reflect the new "knowledge manager". They are concerned to demonstrate the competencies and skills needed in modern organisations and "how information skills needs to be dispersed throughout organisations by focusing information management within a knowledge environment". Their analysis results in a suggestion that there are four core competencies for an information professional. The first of these competencies is to understand user requirements. Information managers need to be able to deal with information auditing, information processes and problem formulation. The second core competency is being able to source information. This competency relates to content management, the sources of information and how to use and integrate them effectively with research skills and the retrieval of data. Third, being able to disseminate and deliver information is an important competency. This competency requires an ability to abstract from data, analyse it, be able to use it in the application and synthesise information and data from

Figure 3 The hierarchy of competencies in information systems

| Information and knowledge management |
| Information mastery |
| Information architecture and structure |
| Technology applications |

various sources. Fourth, the competency of managing information by archiving, cataloguing, undertaking records management, using taxonomic and bibliometric techniques and undertaking text analysis is also important. Again the argument is that these competencies are hierarchical, and this is represented in Figure 4. However, they differ little from the set for LIS illustrated in Figure 2.

Core competencies in information management

Thirty years ago the protean Shera (1972, p. 110) encapsulated the focal points and significance of information management before we knew that information management existed as a discipline:

> The communication process is a duality of system and message, of that which is transmitted as well as the manner of its transmission. Therefore, the [information professional] must see his role in the communication process as being more than a link in a chain; he must also concern himself with the knowledge he communicates, and the importance of that knowledge both to the individual and to society.

It is our perception that the "duality of system and message" is what gives information management its unique place in the information professions. Information management can be defined as:

> ... an imprecise term for the various activities that contribute to the effective production, co-ordination, storage, retrieval and dissemination of information, in whatever format, and from internal or external sources, leading to the more efficient functioning of the organization. Many specialist processes may be involved; most usually used in the corporate, private-sector context, but sometimes extended to include the more technologically-based activities of research libraries (Prytherch, 2000, p. 372).

Figure 4 Competencies in information management

Manage information
Disseminate and deliver information
Source information
Understand user requirements

Source: Abell and Oxbrow (2001)

"Imprecise" here should not be taken as a negative attribute, because this is an indication of the flexibility of the field as compared with a more restricted discipline such as library science, which has tended to be regarded as the profession bound to libraries. The information manager is much less restricted in his field of operation, and this is reflected in the definition.

Downie has offered an analysis of LIS education in the USA that we believe is appropriate for information management education in our context (Downie, 1999). He maintains that there are two schools of LIS education, one user-centred, librarian focused; the other, system-centred, technology focused. In our scheme this applies to library science and information systems education. The former is qualitative in its assessment approach; it is situational, constructivist and subjective. The latter is quantitative in assessment; and it is algorithmic, universal and objective. For the user-centred school the educational focus has been on reference and readers' advisory service, user services, collection development, etc. For the system-centred school emphasis has been on indexing and abstracting, information retrieval, automation systems, etc.

> The user-centered school has contributed greatly to the past success of LIS practitioners everywhere. It will continue to do so in the future. However, as necessary as the user-centered approaches are to meet the challenges posed by disintermediation, they are not sufficient. In light of disintermediation, we must re-evaluate the predominant role the user-centered school has assumed in LIS education. System-centered approaches must be re-incorporated, if not into the core, then at least into the mainstream of LIS education. The system-centered school encompasses a body of theory and praxis that are also necessary; but they, too, are not sufficient. This being the case, we must strive to exploit the best of what both schools have to offer. In short, the two schools must be brought together into a reharmonized whole where the voice of neither drowns out the other (Downie, 1999).

It is our perception that LIS education in Australia and New Zealand has been principally (although not exclusively) user-centred, and that information systems education in these countries has been clearly system-centred. With the evolution of information management education as a combination of and complement to these two

disciplines, there is in our context an opportunity to combine both user- and system-centred approaches in new and stimulating ways. This is the function of our set of core competencies as described below. This is significant in that the essential differentiation of the key disciplines, library studies and information science and information systems, reflects the dichotomy described above. At one end the user is key and drives the development, management and use of information. At the other end the user is one part of the process of developing a systemic view and use of information which reflects both the supply of information by a producer and provider and the demand for information by a user.

Revisiting the sets of core competencies identified in this paper in Figures 2, 3 and 4 (see Figure 5) suggests that there are similarities and differences in how the competencies are perceived in the related disciplines. Our concern here is to see if there is a better way to conceptualise the set of core competencies for IM as a discipline. We are proposing another perspective, and that is of IM being not a separate discipline but a meta discipline encompassing the competency sets of the disciplines which frame the meta structure. However, what then are the core competencies for this meta discipline? Is it all of the core competencies from each discipline? Abell and Oxbrow (2001) suggest that the core competencies are more akin to those we have identified as core for LIS. If we revisit the lists of competencies for the two disciplines (Table I), we have the opportunity to develop the set of competencies for this meta discipline by wedding the lists in some coherent form.
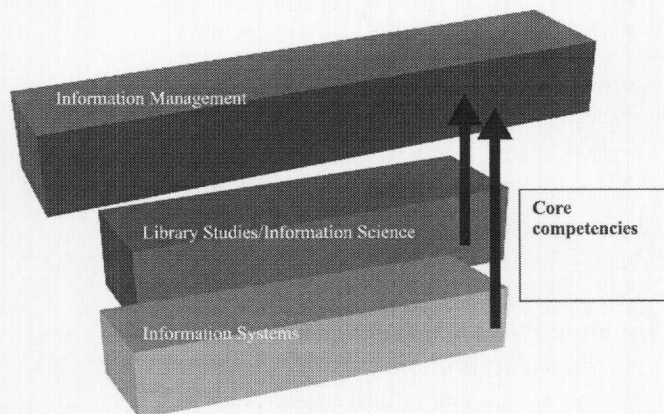
Table I The core competencies of IS and LIS

Information systems science	Library and information
Information and knowledge management	Client needs and services
Information mastery	Management
Information architecture and structure	Technology utilisation
Technology applications	Organisation of knowledge and knowledge resources

It appears that some competencies are similar, for example, the management and technology competencies. In another sense there is similarity in the "organisation of knowledge and knowledge resources" and "information architecture and structure". The differences perhaps are more in the approach, with IS focusing on the systemic nature of the architecture, whereas LIS focuses on the structure of the knowledge and its classification. Table II highlights the similarities in the sets of competencies.

The competencies from LIS complement the systems approach of IS with the processes inherent in the LIS professions. The systems competencies point to the need to develop mastery skills in the organisation and systemic architecture of information and knowledge which can be put to use in IM to ensure that client needs and services are met. We would like to suggest that the meta discipline of IM has the core competencies as below:

- Managing information and knowledge for client needs and services.
- Mastering information.
- Organisation of knowledge and knowledge resources through information architecture, systems and structure.
- Technology applications and utilisation.

Such a group of competencies would, one hopes, prepare the information manager to develop skill sets for dealing with both the process and system elements associated with information; with the architectures and

Figure 5 Information management as a meta information discipline

Table II Similar competencies in IS and LIS

Information systems science	Library and information
Information and knowledge management[a]	Client needs and services
Information mastery	Management[a]
Information architecture and structure[b]	Technology utilisation[c]
Technology applications[c]	Organisation of knowledge and knowledge resources[b]

Note: Similarities exist between the items with the same superscripts

mastery of data and data organisation, mining and warehousing for efficiency; and with developing and adopting management skills to enable process management for better effectiveness and efficiency, thus meeting client needs and services in the best possible way.

These generic competencies should facilitate a broadly flexible approach to the ways information has to be managed in the digital age so that, whatever the contextual requirements, the information or knowledge manager has the meta perspective to complement the detailed and more exact skills of the LIS expert or the IS analyst. Within these broad categories the specific subsets are yet to be articulated in a definitive way, but perhaps it would be too constraining if they are. By adopting this flexible approach to competencies the educational community will be reflecting the reality of professionals who are employed as information managers and knowledge managers. That is, this reflects the functions embedded in information management positions, rather than having them restricted by a paucity of meta skills sometimes inherent in the discipline-focussed expertise common in LIS and IS.

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