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Competencies for Information Professionals in the Digital Era:

Issues, Opportunities, and challenges

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Abstract: *Technological developments and the birth of knowledge economy has led to the new era, viz the knowledge era. This has opened up new avenues in the information profession, leading to emerging roles of the information professionals (IPs). At this critical juncture, new competencies are needed for the new breed of IPs, calling for the active process of learning, relearning, and unlearning on the parts of the IPs. The ongoing development of advanced technologies in libraries and information agencies has placed a high priority on ICT competencies among library staff and IPs. The shift towards knowledge-based economy means the rising challenges faced by the IPs in handling their organization's information needs. Learning technology skills and acquiring knowledge in appropriate areas is vital in keeping library staff informed and effective in performing their job tasks. Librarians and IPs are urged to be a part of this changing environment by furthering their education in technical and computer technology.*

Keywords: *Information professionals, competencies, training, continuous education, ICT, and digital era.*

> *Information Professionals (IPs) in Malaysia are in a period in which they are competing and constantly being competed with very fiercely for continued responsibility and control of information functions. IPs must play a pivotal role in the advancement of knowledge in the digital era and the application of new competencies is inevitable.*
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> *(RAY)*

Introduction

Librarians and information professionals (IPs) today are confronted with challenges in achieving excellence in light of globalization and k-economy. New developments and issues facing them are, among others, the advent of the information and communication technology (ICT) intertwined with the emergence of knowledge management as the main component of the current economic activity. IPs who commit themselves to continuous learning, must be willing to work outside traditional aspects

of librarianships and demonstrate leadership in involving themselves with new areas for knowledge workers. The digital era calls for new competencies so that the IPs could well address the new expectations of their services.

Rationale

Libraries and information systems everywhere are increasingly and greatly affected in all of their functions by the rapid evolution of the digital age. While the growing World Wide Web and the Internet in general, greatly enhances access to a variety of information resources, it also provides for many new and complex challenges and problems for libraries and information systems, as well as for their creators and users. The critical issue is to ensure the effective and efficient flow of information from the generators to users of information in the digital environment, using electronic resources, services, and networks. A complex communication chain is involved with libraries and information systems playing an important, even critical role. Subsequently, a number of new requirements are needed to successfully implement the new applications. Such complexity requires librarians and IPs to continuously keep abreast with new methods and techniques and be informed regularly about new trends and approaches. Constant update of their professional knowledge and competencies are needed.

In the school library scenario, for example, enhancement in ICT applications is regarded as most appropriate at this juncture when the government has been actively advocating the concept of smart school which emphasizes on resource-based learning. In the public library situation on the other hand, the problems associated with digital divide and computer literacy among the society must also to be addressed. For the academic libraries on the other hand, the proliferation of subjects and research call for more sophisticated information services that can be

derived from a great variety of electronic services. In special libraries and information centers, utilization of knowledge has become apriority and this has placed the libraries in a more dynamic position in the provision and sharing of the information and knowledge. What is crucial is to ensure that the well digitized information centers and agencies, and a proper management from well trained and competent IPs is provided to enable the enhancement of the information services and. process.

The ICT is now indispensable in the development of learning and support systems. The development of new methods of structuring and accessing knowledge and the ability to interact with and among the creators and suppliers of knowledge, using ICT has radically changed the mode of information management and services. Competencies are defined as the interplay of knowledge, understanding, skills, and attitudes required to do a job effectively from the point of view of the performer and the observer. These include both professional and personal competencies. This set of knowledge and skills unique to IPs allows them to function in a variety of environments to produce, not only an effective, but also a value-added, customized information services.

Librarians and IPs are often hampered by their own unfamiliarity with new technologies, and never less so than when dealing with users who are increasingly computer savvy and netsurfing experience. As society's custodies of information and knowledge, libraries must keep pace with technological change, more broadened the range of materials available for browsing (Pescovitz, 1995). It is the duty IPs to be familiar with a rich range of both traditional and innovative information technologies and resources. They must also be familiar with the information and communication technologies which promise to revolutionize the information services worldwide.

The motivation for applying new technologies to the library systems arises from three basic sources: the need to make existing library resources more easily accessible to users; the need to use resources in a way that is more friendly to the environment, and; the need to make the jobs of library staff easier, less frustrating, and hence, less stressful" (Barker, 1994, p. 224). Essentially, the new breed of IPs must seek to acquire additional skills and competencies as seen in Fig 1.

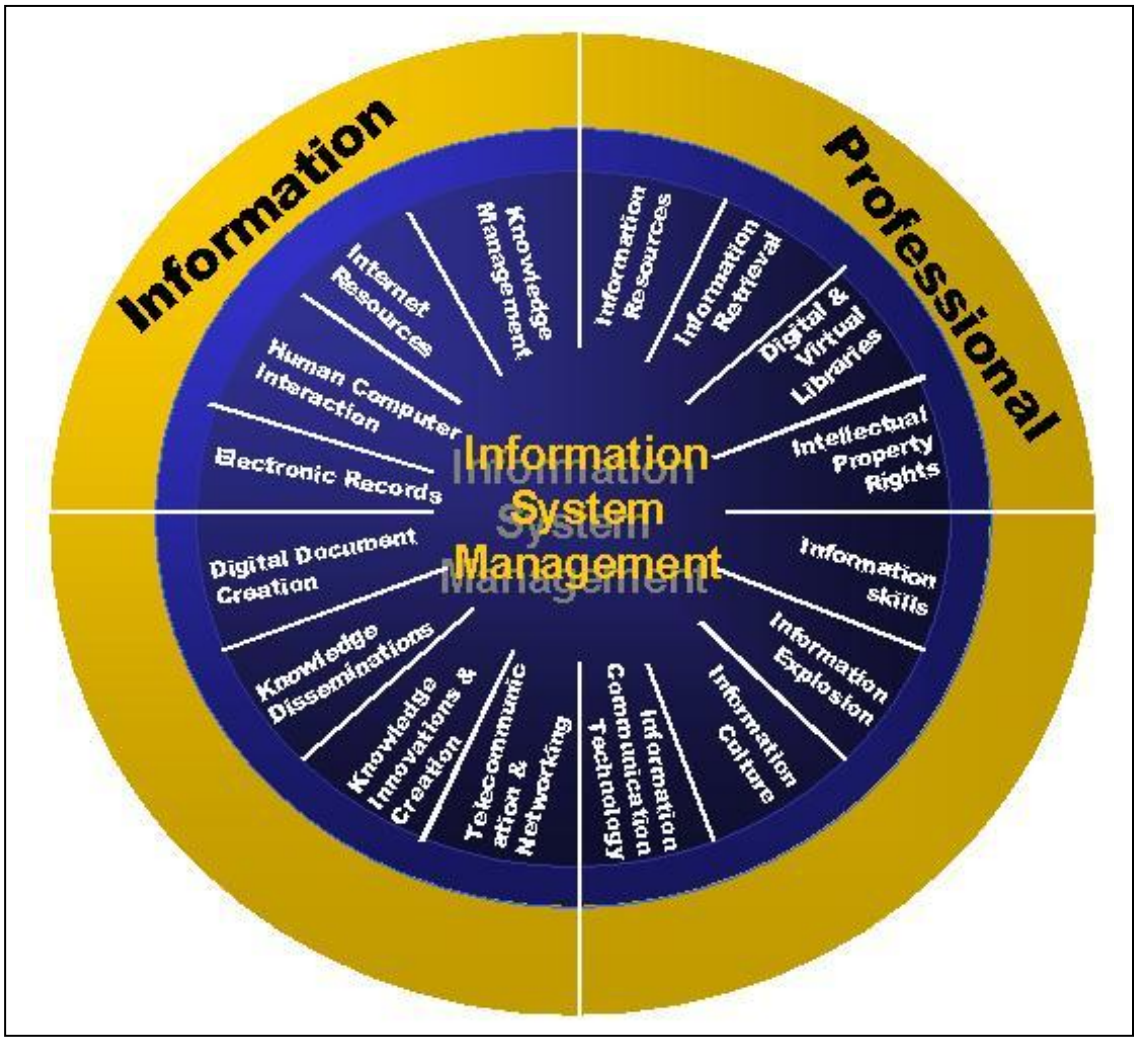

Figure 1: New Competencies for Information Professionals

Information and Knowledge Literacy Imbedded through the Application of ICT

Librarians and information managers of the new trend have to inculcate the knowledge management culture. In order to make full use and

advantage of knowledge, the IPs should strive to boost up the level of information literacy and culture among them so that they can fit in the new information and knowledge era. The emerging IPs will have the added responsibilities to focus information and knowledge management that includes both tacit and explicit knowledge.

The above factors are used in upgrading the competencies of IPs, giving emphasis in the concept and application of ICT as shown in figure 1. The new breed of IPs should also take into consideration the needs of business organizations in the current globalization age. Competitive intelligence, often taken as the knowledge management systems can be effective if it is involved in the filtering, synthesizing, and adding context to information from the external environment.

Profile of the New Information Professionals (IPs)

The competencies emphasized by the information worker of the 21st century are given on new technology skills which becomes part and parcel of the information industries. The new information and knowledge officers would now be able to develop a conducive environment for effective creation, transfer, utilize, repackage and presentation of knowledge. The information management process would enable them to solve business problems, join the system discussions, contribute to strategic plans, and demonstrate the impact to the organization. They are the facilitators in knowledge sharing with the application of ICT and the other is the codification of knowledge by proper documentation. They should be partners in the organizational leap toward the knowledge management and the digital era. In short, they should adapt themselves in aligning with the trend towards a knowledge-intensive economy, taking advantage of the advanced ICT.

Data collected from past graduates of the Faculty of Information Management, UiTM shows that their career paths can be categorized into at least seven areas of "Information Professionals," which calls for a variety of competencies. They are:

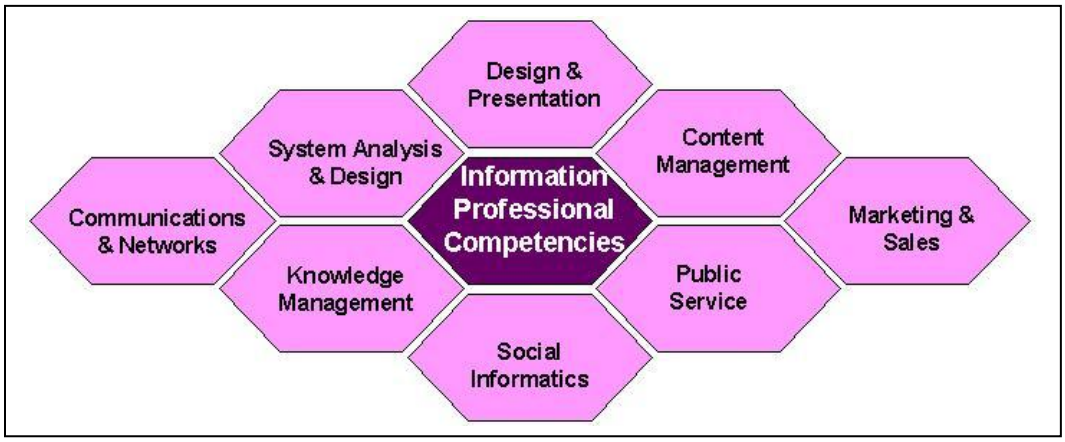

Figure 2: Information Professional Competencies

In considering the competencies needed by these new era IPs, attention has been given on the design of their training and retraining programs so that they can acquire the following competencies:

- Managing and application of advance information and communication technologies (ICT)
- Design and instill the techniques and processes in creating, protecting and the use of knowledge
- Managing information organizations
- Managing information resources
- Managing information services and information literacy
- Managing knowledge

These competencies would enable the workers to convert the core knowledge competencies into high quality products and services faster and

more efficiently through a great variety of information sources, including the electronic sources.

Conventional information professionals are very much confined to more generic designations such as librarian, archivist and records manager. Currently, there are various designations or posts, which relate to the managing of information, and knowledge in principle. These new breed of IPs are widely employed by industries, which denote the current demands for the new and emerging information professionals. In addition to that, there are other designations as illustrated in figure 3.

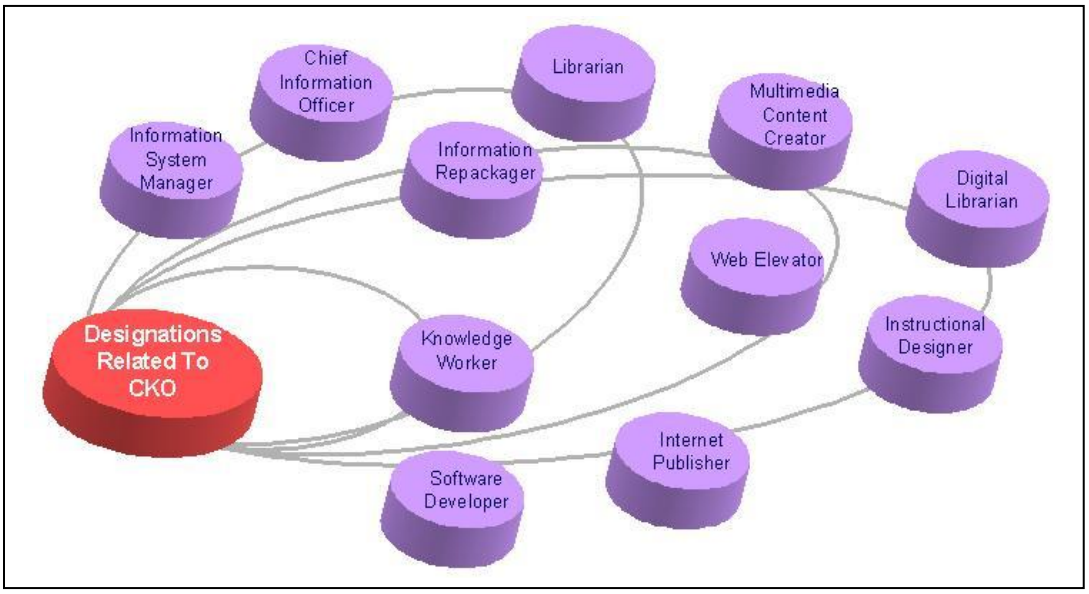

Figure 3: Designations of Emerging Information Professionals

Core knowledge competencies

The core competencies anchor the professional competencies, and are essential for every IPs. These are paramount to the value and viability of the profession, involving the expertise and technical knowledge, relevant to information management. They may be the content or subject matter, based on the combination of capabilities and competencies to enable them to manage information and services as seen in figure 4.

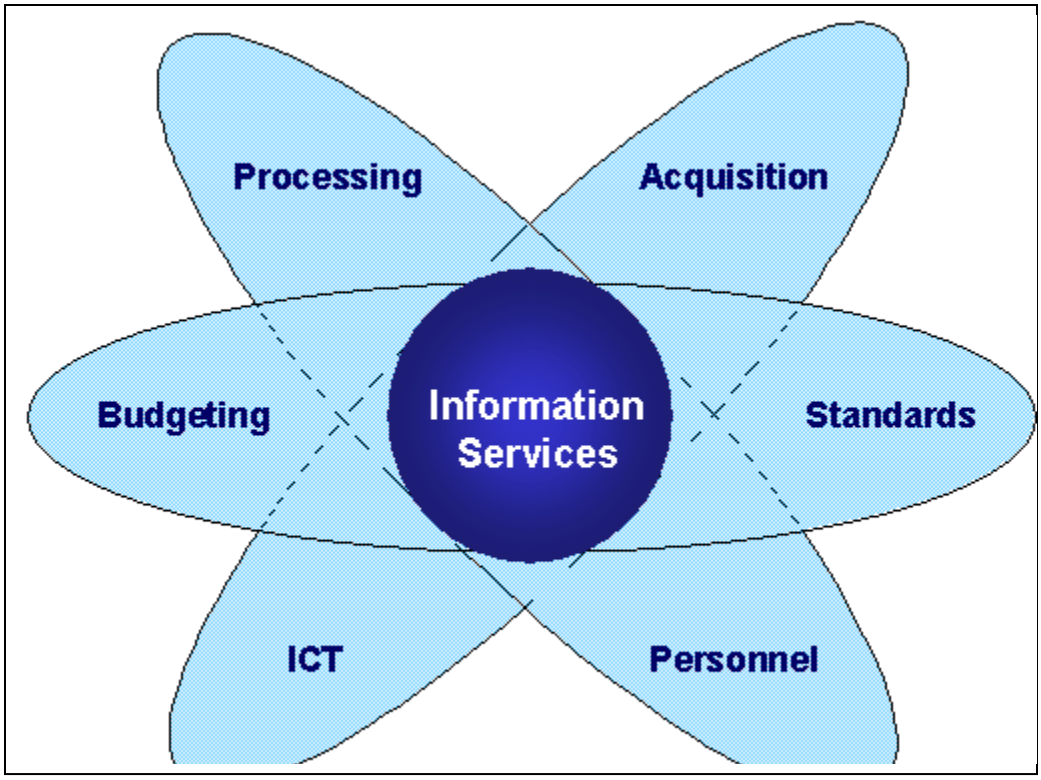

Figure 4: Conventional Setup of a Library and Information Center

In the wake of the k-economy, library which has long been the treasure house of human knowledge IPs, must participate in information and technological developments, and provide important linkages in the knowledge innovation. It is thus inevitable for the new IPs to attain these new elements to cope with the growing needs of relevant and current knowledge. However, the research and application of information resources, information retrieval, development of digital and virtual libraries, information issues such as intellectual property rights, misinformation and information explosion will remain important.

Important Competencies in the Digital Era

Information skills include using a computer for processing information; i.e., acquiring and evaluating, organizing and maintaining, interpreting and

communicating information. IPs must also be competent in the system and process skills- that are the understanding of systems, correcting performance, improving and designing systems. They must also have the skills which involve the selection and utilization of technology and applying it to a task. Interpersonal skills is also vital because it will help the IPs in negotiating, exercising leadership, working with diversity, teaching others new skills, servicing clients and customers, participating as a team member.

Challenges faced by IPs . Amidst the changes in skills

The profession must be proactive in pursuing added-value activities based, on new ICT so that it will not become superfluous.
It is a tool for management of information in libraries and information agencies. The use of new and advanced ICT could widen the scope of knowledge acquisition, raises knowledge acquisition speed and reduces cost. It is now possible to connect closely knowledge sources and knowledge workers by numerous networking systems constructed for resource sharing. ICT functions as tool for knowledge innovation because it is now indispensable in the application and exchange of knowledge in all fields. In line with the advancement of ICT, information services should pay attention to relevance and efficiency, based on high-speed information networking systems.

The continuing advances of technological innovation require librarians and IPs to keep abreast with new ICT and at the same time continue to upgrade their technical skills. Maintaining the ICT skills to keep pace with changing trend has been regarded as a critical goal in the present explosion of knowledge, as shown in Fig 5. They are:

Legal competencies:

- data protection and information technology security
- privacy legislation
- copyright and intellectual ownership
- access and freedom of information
- archival law and ethics
- legal evidence/juridical aspects of electronic records

Organizational competencies:

- information management
- organizational dynamics and change mgt
- information policy:
- *records/information as organizational assets*
- *resource sharing*
- *roles and responsibilities*
- *policy formation*

- information technology and mgt in public administrations
- business process redesign (BPR) in relation to the use of information technology
- interaction bet working processes and records/information

Methodological competence:

- project management
- software engineering
- cost/benefit analysis
- programmed planning, development & evaluation
- strategies for gaining support & sustaining programmes

Information technology competence:

- basic concepts and terminology of it systems
- components of it systems (e.g. hardware, software, storage media, standards, telecommunications & networks)
- data structures and formats (standards) (e.g. databases, numeric files, text files, gis. cad, spreadsheets, bit-mapped images, compound documents?
- long-term preservation of electronic records:
- *preservation hazards*
- *migration strategies*
- *metadata*
- *documentation and metadata standards*

Systems design competence:

- information systems architecture
- different types and function of office systems (electronic registry systems, document mgt systems, workflow systems, groupware systems)
- systems analysis & evaluation (business function analysis, conceptual data models, systems development methodologies, flowcharts)

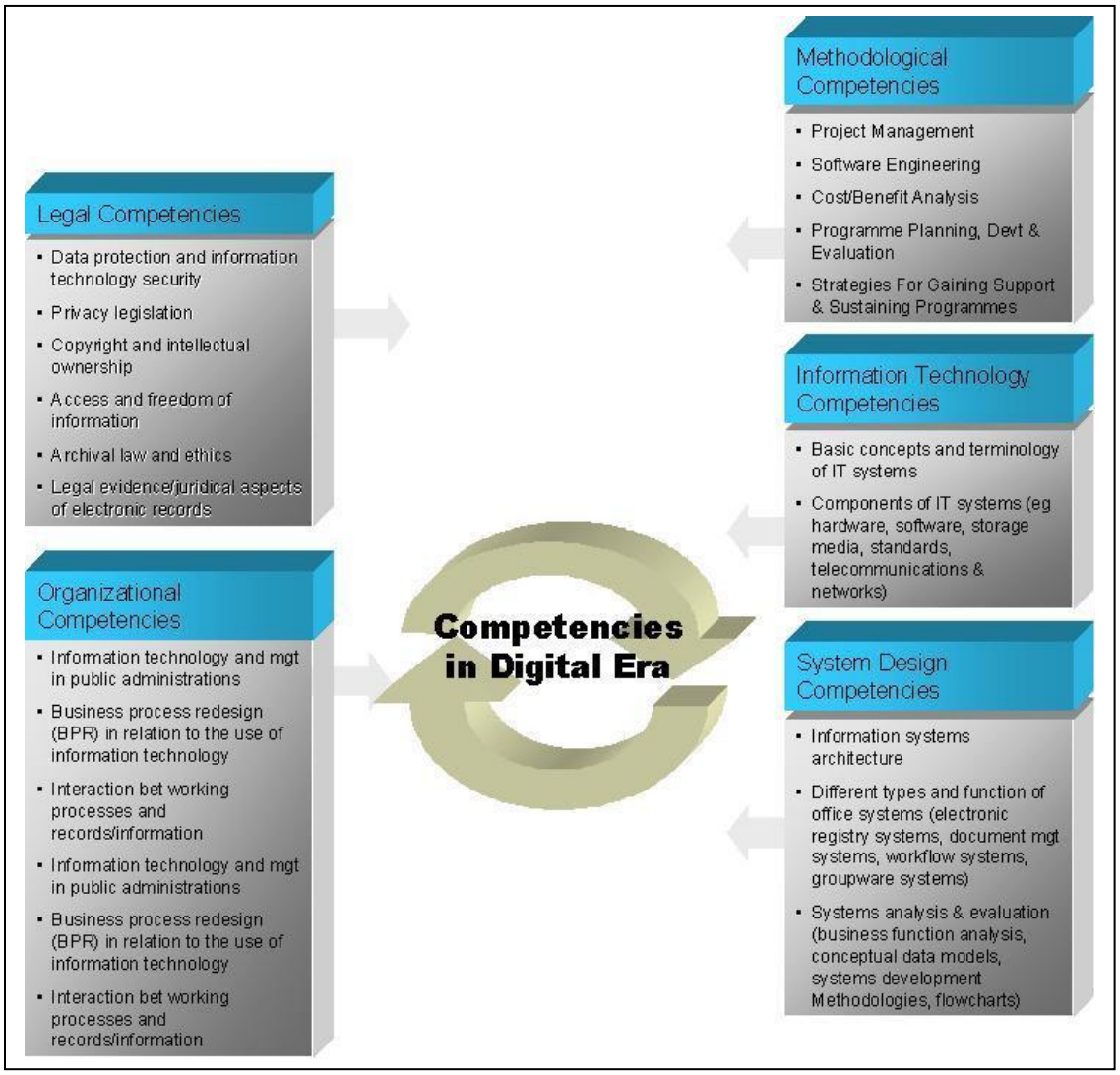

Figure 5: Competencies in Digital Era

Information skills

In this new knowledge age people will make their living by handling information more than by growing crops or making products. This change is being made possible by the emergence of ICT. With knowledge about information and skills to locate the information, including through the

multi-dimensional electronic information, IPs can improve in the pursuance of information to support the information services. Information skills course for IPs should be continuously given to update the information literacy level.

CLASSIFICATION OF INFORMATION SKILL

In addition to the above ICT competencies, IPs must be able to apply the information skills that will enable them to do research in libraries, get access to information and finally get the information to enable them to begin the research. Within the context of the ICT era, IPs must be well versed with the following information skills, Such as the information system skills, retrieving information skills, evaluating information skills, organizing information skills, documentation skills, and communication information skills, as shown in fig. 6.

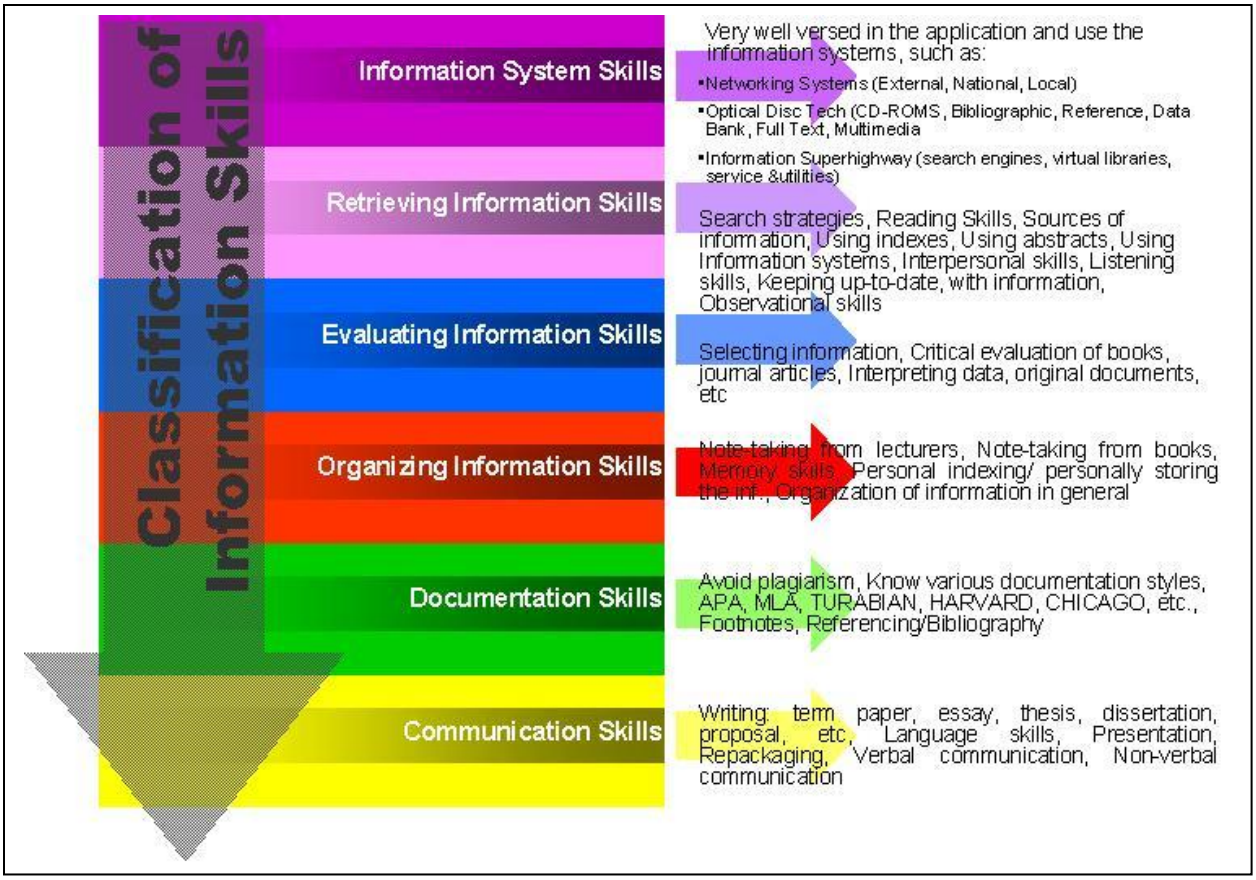

Figure 6: Classification of Information Skills

Development of Digital and Virtual Libraries and Information Centers

ICT are regarded as the enablers of change. Although they do not by themselves create transformations in society, they are regarded as facilitators of knowledge creation in innovative societies. The ICT is now indispensable in the management, services and support systems of libraries in information agencies. The development of new methods of structuring and accessing knowledge and the ability to interact with and among the creators and suppliers of knowledge using ICT has radically changed the mode of information services and research,. Libraries, information agencies and corporate organizations have invested on possibly, the-state-of-the-art ICT facilities in order for them to become an active player in management of knowledge, assisting in the knowledge creation, innovation and dissemination. The definitions of 'digital libraries continue to evolve as new technologies appear. However, the most simplified, comprehensive definition "maybe considered to be any of these: (1) machine-readable data files, often with scientific and technical applications; (2) components of the emerging National Information Infrastructure; (3) various online databases and CD-ROM information products; (4) computer storage devices on which information resides, such as optical disk jukeboxes/magnetic tape autoloaders; and (5) computerized networked library systems" (Matson & Bonski, 1997, p. 87). A digital library will be the electronic equivalent of a traditional library. A digital library will be the electronic equivalent of a traditional library. On the other hand, Saffady believes that a digital library is one that maintains all, or a substantial part of its collection in computer processing form as an alternative supplement or complement to the conventional printed and microfilm materials which now dominate library collections (Saffady, 1995).

The ICT knowledge and competencies, other than the networking systems and optical disk technologies that are needed in the management and dissemination of information and knowledge are clearly stated by Thomas H. Davenport. They are, "Internet, Intranet and Extranet; storage architecture; database management systems; metadata; data acquisition and gathering; dissemination; messaging; push and pull; information retrieval; information resources sharing; groupware; middleware; online analytical processing; multidimensional analysis and data mining." He further reiterates the need for the basic expertise in data processing, reporting, networked communication, document management, information search and retrieval, relational and object-oriented databases, electronic publishing, work flow and help desks to fulfill a complete objective of knowledge management (Davenport, 1997).

IPs should realize that KM is concerned with capturing an organization's know-how and knows- what through creation, collection, storage, distribution and application. It means identifying and harnessing the collective knowledge of the organization gained through experience and competencies. The goal of KM for an organization is to create a learning organization that is capable of measuring, storing and capitalizing on the expertise of employees to create an organization that is more than the sum of its parts (Bollinger & Smith, 2001)

According to Dan Holtshouse (www.cio.com), Xerox director of business strategy knowledge initiatives, there are 10 domains of knowledge which give structure to activities around which KM plans should be built. It is within this context that librarians and IPS must address. After all, libraries have long been the custody of human knowledge of all kinds.

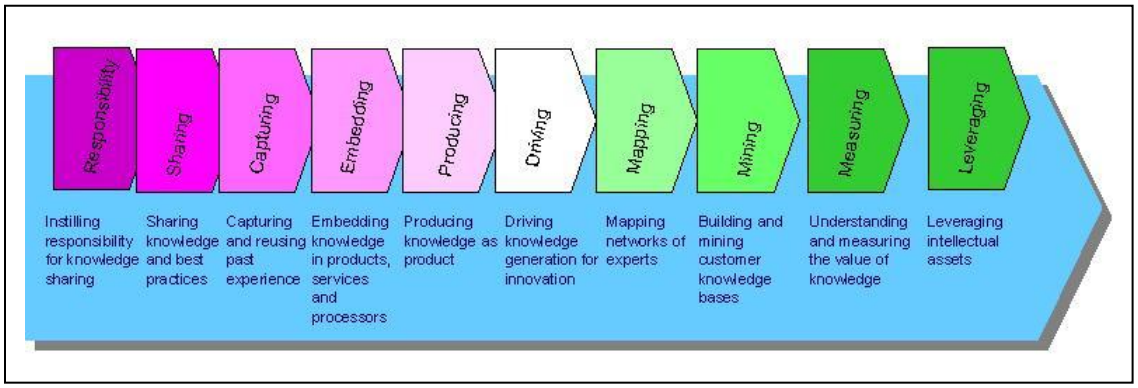

Figure 7: 10 Domain of Knowledge

Core performance capabilities

These competencies would enable the workers to convert the core knowledge competencies into high quality products and services faster and more efficiently. For example, in selling the new products, customizing products quickly, applying logistic management, attracting and sustaining high quality employees and knowledge sharing would help in increase productivity and profit.

Leader Competencies in Information Management

Finally, on top of the aforementioned competencies, leadership competencies are regarded as crucial in achieving the goals of the organization because it has the specific roles. This is in view of the fact that this competency are organization-specific in that it guides direction; it is measurable; the competencies can be learned; it can distinguish and differentiate the organization, and it can help integrate management practices.(Intagliata, 20023). In the field of information management, the societal, environmental and the technological changes have prompted the need for the leadership competencies. Other factors includes the increased accountability, changing organizational structures, the proliferation of

teams, increased competition, proliferation of ICT applications in the provision of information services, and the advent of learning organization model. (Winston, 2003). The statement of leadership competencies should be formulated which should cover, among others, cultivating the qualities of a good leader and knows when to exercise leadership. He/she will seek out challenges and capitalize on new opportunities, including using technology as an enabler of new information ides, products and services.

Training of the New Breeds of IPs

The criteria for the inclusion of new disciplines in the formal training of IPs should not exclude the ICT elements needed for the successful implementation of knowledge management, with other concentration should remain if not improved, such as the modular system, internet resources, and element of digital document, as shown in fig. 8:

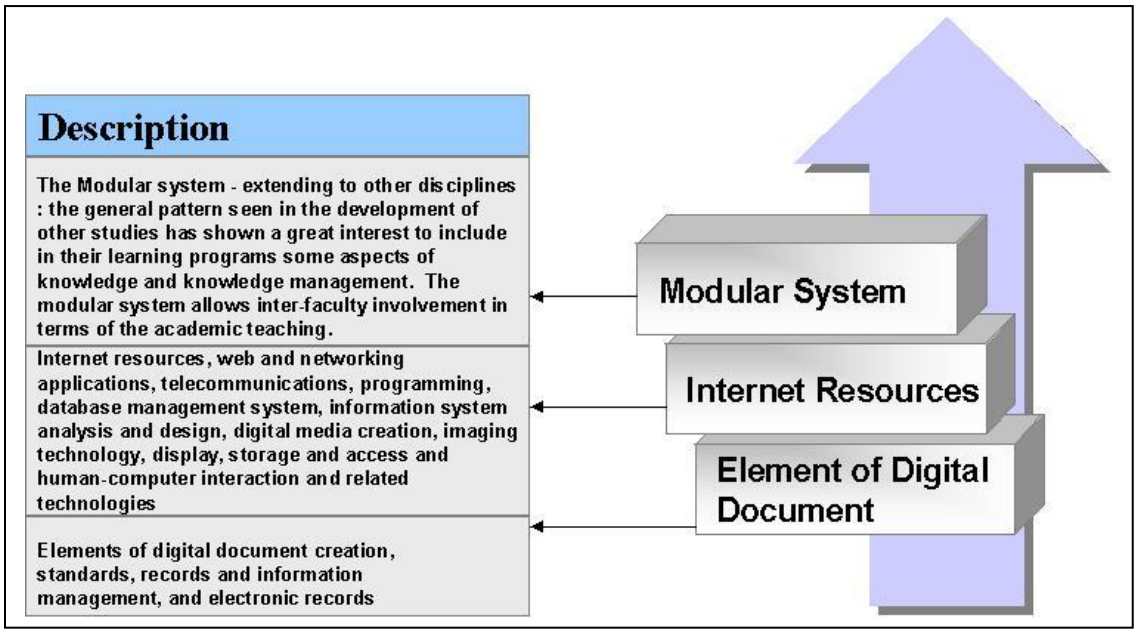

Figure 8: Training Module for Information professional

The business environment will highly be dependent upon the strategic information management which makes it possible to impart the capabilities of evaluating and manipulating information not only to find and store it.

Finally, the increasing importance should place upon learning organization model. Learning organization should be established as it can play important role in the identification of competencies related to human resource management, including recruitment and training, development of information and knowledge skills, and evaluation of the performance of staff in terms of analytical skills, decision-making, communication skills, organizational skills and general and specific management skills. The curriculum of the information management schools must keep pace with the new societal and technological developments, in addition to the continuous on job training and reskilling programs.

Challenges and Recommendations

With the advent of advanced ICT at an increased and indomitable rate, librarians and IPs are forced to make and accept changes in their workforce. A more specialized and sophisticated information needs require for more active roles of IPs in the information industry in Malaysia. The competencies and skills of the IPs must be closely related to what they do at work. The core competencies must be addressed first in addition to all levels of ICT needed by this worker. They must have an opportunity to practice the skills/competencies to create a solid foundation and create ways to help workers maintain the skills and competencies.

Within this context, the new curriculum should also, as already mentioned pay attention to the task of building awareness and cultural receptivity to technological development, taking initiatives to change behavior relating to the application and the new systems and design. At the same time they

are expected to master the activities which fall under the rubric of knowledge management, with the goal of maximizing their skills and effectively meeting the organization's objectives. The new IPs should be capable of searching, not only the sources of information but also the wide variety of information formats and expanding the information boundaries to include interpreting the sources, extracting, and reorganizing its information into a new synthesis and usage. This value-added information service is seen indispensable in certain business commitment and it is to be expected that the concept of information analysis center would be applied. Others factors must also be considered as regards to the competencies to the IPs. They:

- Focus on library school education and the role of educators in instilling appropriate core competencies of IPs.
- Some core competencies remain intrinsic to the profession. Communication skills, critical thinking, and judgment will always be necessary but, as information workers adapt to the "knowledge revolution", new trends requiring new competencies emerge.
- There is also the need for flexibility towards becoming information entrepreneurs, no longer based in institutions or defined by organizations. There is also need to have strategic skill sets, including the ability to analyze and adjust their thinking within a new organizational context.
- Libraries and information agencies must accommodate the new emphasis on technology, information systems, electronic research methods, and information delivery.
- On-the-job training is still required to offer subject-specific information to complement the core competencies
- The Web, information navigation and the future role of librarians. The continuing lack of understanding about the role of libraries and the value of information professionals present special challenges for those attempting to re-define their roles in the light of the new core competencies.
- Librarians provide access to physical and intellectual collections of recorded knowledge. This role, along with long-term preservation and collection of knowledge resources, should continue.
- Activities to be expanded include: the creation of purposefully identified collections, which are not

necessarily housed within one building; greater involvement in creating meta-data and content description;

- The provision of links between electronic and print resources; a shift in focus from traditional bibliographic instruction to information navigation skills; and finally, "value-added" extraction and analysis of retrieved information according to user needs.

Importance must be paced on information navigation. New terms, such as, “Knowledge Prospector", "Knowledge Navigator", and "Knowledge Interpreter" have appeared to indicate the importance placed on information navigation. With their existing skill sets and their unique knowledge of their clients and recorded knowledge domains, IPs are well placed to take on these new roles.

Qualities such as, "entrepreneurism" becomes the consensus among many employers. There is a move towards a holistic approach to the management, transfer and use of information and knowledge has opened new fields of endeavor to information professionals. The new breed of IPs also apply the business intelligence competency; Internet and intranet Webmasters; and information-industry work such as market development, sales and customer support of information services and products.

Conclusion

Information Professional’ (IPs) involvement as change agents is crucial in realizing the nation's aspiration towards a developed status by the year 2020. This results in the urgent need for more IPs with varied capabilities to meet the new demands of the patrons. Evolution of new knowledge make it conceivable for the library and information programmes to make adjustment to the core courses, perceived as necessary in preparing graduates to cope effectively with the rapid changes within our society The need for new competencies, amidst the digital era of professional performance is obvious, adequate training and exposure must be formulated. To this end, it has been the goal of libraries and information

agencies to, not only be able to prepare IPs for appropriate responsibilities but also to equip them with the necessary skills. The guiding principle has always been governed by the acceptance of the philosophical as well as the functional values of the training program. IPs of today would now embark on the knowledge and the ICT skills and programs to accommodate adequate skills necessary to develop into knowledge workers, a culture inherent in current globalization era and to inculcate the habit of continuous reading, keeping abreast with knowledge, and researching and proceeding with the on-going learning.

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