



Key skills and competencies of a new generation of LIS professionals

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Abstract:

This paper presents the key skills and competencies of a new generation of LIS professionals. Firstly, it gives an introductory background of the digital era which impacts on the changes occurring in libraries. Secondly, it presents a review of the literatures on skills and knowledge of LIS professionals working in a digital era and related researches. Thirdly, it describes methodology of this study and key skills and competencies of a new generation of LIS professionals which can be classified as personal skills, generic skills, and discipline-specific knowledge. Finally, it presents the image of the new generation of LIS professionals.

Key words: LIS professionals, skills and knowledge

Background

Facing technological innovations, for instance digitization, electronic publishing, Web 2.0, Library 2.0, RSS, Blogs, Wikis, SMS, Podcasting, Mashups, Tagging, Folksonomies, OSS, OA, etc., libraries worldwide have been adjusting to the shift from the printed era to the digital era. The speed of change has created a new librarian landscape in terms of services and activities. These innovations impact the roles, competencies, skills and knowledge of LIS professionals. As stated in the paper of Erlendsdóttir (1998) “We are no longer just the guardians of books. We are information providers in an environment that is constantly changing and where the information needs to be gathered quickly and effectively. Today, our mission is to promote services for the ever increasing amount of information. And even if we don’t like it, information technology has changed our jobs.”

Research Problem

Related to the changes within the LIS profession, one of the most interesting issues which LIS professionals have discussed and studied is “What are the skills and competencies required for LIS professionals to be effective and efficient working in the digital era?”

Spink & Cool (1999) studied curricula required to educate information professionals working in a digital library environment, and they stated that “We do not know what knowledge is required to produce information or computer professionals to work as digital librarians, digital developers, or in other job categories, or even what the job designations or requirements will be in the future.”

Weech (2005) analyzed courses and modules of education for digital librarianship to find out the knowledge and skills needed of an information professional working in the digital library environment. Weech (2005, p.1) stated that “we do not know much about what skills are needed for professionals who work as digital librarians.”

Additionally, the number of interested LIS professionals to work on this area has increased. It can be proved by several studies such as Feret & Marcinek (1999); Goulding et al.,(1999); Tennant (1999), Lynch & Smith (2001); Kwasik (2002); Lovato-Grassman (2003); Partridge & Hallam (2004); Myburgh (2005); O’Connor & Li (2008); Orme (2008); Howard (2009), and Nonthacumjane (2010).

Consequently, it is also expected that this issue would be critical considered as a must to study or observe the result.

The major research question of this study is: What are key skills and competencies of a new generation of LIS professionals?

Literature Review

Generally, the professional discussion relates to the competencies, skills and knowledge aspect of what are required by a LIS professionals working in an era of digital information. The main focus of this part is to indicate the core skills and knowledge that are required.

Changing Roles and Skills of LIS Professionals

As information technology (IT) has become part of everyday life, Dolan & Schumacher (1997) emphasized that the influx of the internet and innovative technologies impacted the LIS professionals that they enable to be qualified in a new variety of technological career. Ashcroft (2004) indicated that the LIS professionals need to change because of the IT trends, thus their roles, characteristics and skills are set to adjust to the changes. Fourie (2004) indicated that IT has impacted on the future of librarians’ work activities and responsibilities. She described how librarians are in the cyberspace world and their roles have to be changed according to the new IT developments.

Categories of Skills

Skills categories have been classified by some LIS researchers as follows:

Feret & Marcinek (1999) utilized the Delphi method to predict the future role of the academic library and the skills that might be required by the academic librarian in 2005. The findings were divided in the five main categories, namely communication or training skills; IT skills; managerial; commitment; and subject knowledge or profiling. Teamwork skills, public communication skills, project management skills, leadership qualities, knowledge of international standards, commitment to the profession and flexibility were also mentioned as the required skills.

Goulding, Bromham, Hannbuss & Cramer (1999) investigated the personal characteristics necessary for information professionals by conducting a content analysis of job advertisements in order to find a list of the personal characteristics. The questionnaire was sent to chief librarians in the United Kingdom including all library sectors. The results summarized the four most essential qualities skills required namely communication skills, flexibility, the ability to work under pressure, and dealing with a range of users.

Lynch & Smith (2001) conducted a content analysis of 220 job advertisements from American academic libraries. They found that oral and written communication skills were the most important. However, flexibility, creativity and leadership were also appearing more frequently in the advertisements. Computer technologies and related skills were regularly mentioned in the ads.

Kwasik (2002) studied the technological change connecting with serials librarians. She discovered that the traditional skills were the most frequently mentioned as a requirement, followed by communication skills at a second place. Additionally, she indicated that the skills that could be fitted to a digital environment, for instance knowledge of metadata standards, markup languages, experience in cataloguing electronic publications and Web design, etc. were normally rated as “knowledge” desired for an information professional.

Partridge & Hallam (2004) investigated the comparison of the structure of human DNA to the skills, knowledge and attitudes of the model information professional for the twenty-first century. They indicated that both discipline knowledge and generic capabilities were needed for a successful information professional in today’s information environment. They defined generic capabilities as personal and generic skills. They conducted focus groups in the South East Queensland region of Australia with library and information professionals, educators and students by compiling lists in the areas of generic capabilities and discipline knowledge from the literature. They found out that there was little in-depth discussion on the generic capabilities of the information professionals. Ten generic capabilities including information literacy, lifelong learning, teamwork, communication, ethics and social responsibility, project management, critical thinking, problem solving, business acumen, and self management were considered to be significant in the needed framework of an information professional. The focus groups also identified skills which were not presented in the list, such as IT skills, marketing or promotion and teaching skills. The findings were then presented in a list of 14 items of discipline knowledge, including information and society, ethics & legal responsibility, management, information organization, information services, collection management & development, information resources and retrieval, information

literacy instruction, information management, information systems for library and information professionals, web content management, career planning skills, records management and archives, and research. These items were vital to the information professional. The final result of the discussion indicated that the discipline knowledge which was identified covered the essential knowledge. However, political skills, project management, communication and teamwork were also recommended.

Gerolimas & Konsta (2008) conducted their study of 200 job advertisements by collecting data from the United Kingdom, Canada, Australia and the United States in 2006 and 2007 to investigate the qualifications as the skills required of a modern professional librarian. The findings indicated that communication skills were one of the highest ranked skills followed by experience. Additionally, interpersonal skills also appeared frequently.

O'Connor & Li (2008) analyzed 138 academic librarian position advertisements from Australia, America, United Kingdom, New Zealand and Hong Kong between July and November 2007 in a study that covered the period from 1973 to 1998. The position descriptions were analyzed and classified into four groups as computing and technology; interpersonal and intrapersonal; service approaches; and traditional approaches to libraries. In addition, they found that the skills most frequently presented were communication, leadership and interpersonal skills, independent, innovative, confident, judgement, energetic and enthusiasm.

Orme (2008) conducted a content analysis of 180 job advertisements collected between June 2006 and May 2007 from the library sectors in the United Kingdom. She categorized skills into generic, personal and professional. The findings indicated that generic skills are the most normally required. Professional skills and personal skills are as the second and the third place respectively. The three most regular skills in each category are listed below:

Generic: interpersonal/communication; general computing; team work.

Professional: professional related experience; customer service; chartered librarian; cataloging, classification and Metadata.

Personal: enthusiasm; flexibility; self-motivation.

Roles and Skills for the Digital Librarian

Several studies mentioned that the information technology (IT) impacted the information professional's roles, skills and knowledge requirements. Additionally, also IT represents one of the important courses which should be included in the LIS curriculum. (Dolan & Schumacher, 1997; Budd & Miller, 1999; Bakar, 2005, & Khoo, 2005). However, a small number of studies stated the roles and skills for an information professional to work in a digital library environment, as summarized in the following sections.

Tennant (1999) presented a list of discipline-specific knowledge which the digital librarians should know and be qualified in. Tennant classified the vital skills needed to create and manage digital library collections and services namely imaging technologies, optical character recognition (OCR), markup languages, including HTML, SGML, and XML,

cataloging and metadata, indexing and database technology, user interface design, programming, Web technology and project management.

Sreenivasulu (2000) considered that an essential role of a digital librarian in digital libraries was to play a liaison role to bring together users and information. Additionally, he mentioned that one of the essential skills which the digital librarian needed to develop is the ability to manage digital libraries and digital knowledge in terms of digital knowledge management. However, he did not indicate any list of personal characteristics. Among the specific skills needed for working as a digital information professional were knowledge of Web publishing, imaging technologies, optical character recognition and markup languages.

Myburgh (2005) presented the role of the modern information professional in the changing world, noting the new IPs' particular skills, attitudes and values included the capacity for problem solving, teamwork, embracing continuous change, lifelong learning, interdisciplinary knowledge, service commitment demonstrate, effective communication and interpersonal skills, flexible, high ethical standards in professional and personal life demonstration, intellectual openness and curiosity posing, critical and conceptual engagement and reflective thinking of intellectual and practical activity contribute to develop their professional competencies.

Choi & Rasmussen (2006) surveyed practitioners in the United States who were involved in digitization or digital library projects from September to December 2005. One purpose of the study was to find out skills and knowledge required for digital librarians. The findings of the study corresponded with many of the studies previously mentioned. Communication skills, project management and leadership skills were also rated highly. The five highest ranked choices for the technical area were: understanding of digital library architecture and software; knowledge of technical and quality standards; Web markup languages; database development and management systems; and Web design skills. The most highly cited were cataloging, electronic collection development/management and systems analysis.

Choi & Rasmussen (2009) studied the essential qualifications and skills of digital library positions involved in academic libraries. The study was a content analysis of job advertisements collected from the digital library positions posted in College and Research Libraries News from 1999 to 2007. The analyzing of competence requirements in the ads was based on the American Library Association's (ALA) 8 areas of core of librarianship competencies including professional ethics, resource building, knowledge organization, technological knowledge, knowledge dissemination: service, knowledge accumulation: education and lifelong learning, and knowledge inquiry: research, and institution management. (It has been noted that the ALA has published revisions to the competencies in 2009.) The study findings indicated that knowledge and experience with metadata, and the creation and management of digital information were highly required in the advertisements. Technological knowledge and management were most frequently mentioned as required qualifications. The most required area of technical knowledge related to contextual and trend analysis in the digital library environment, including current trends, practices, standards, technology in digital library practice. HTML coding, general computer skills and computer literacy, knowledge and an understanding of information technology, and markup languages such as SGML, XML, and Web development and design were mentioned as the frequently required knowledge and skills. Additionally, communication and interpersonal skills were

also mentioned as being important. Teamwork skills were also mentioned in more than half of the advertisements.

From an Australian perspective, Howard (2009) studied the digital library education. One of the aims of the study was to identify the skills and knowledge required to work in a digital library environment in order to establish what might be included in an LIS curriculum. The target group of the study were practitioners working in academic libraries and LIS educators in Australia. This study used an online questionnaire as a research method. The skills and knowledge applied in the study were classified in three categories as personal skills, generic skills and discipline-specific knowledge. The findings indicated that the personal skills, namely flexible, able to deal with a range of users, adaptable, reflective, detective-like, and responsive to others' need were required working in the digital library environment. The highly desirable choices of generic skills are communication, and critical skills/thinking. In addition, user needs and metadata were regarded as highly desirable knowledge areas.

Nonthacumjane (2010) studied the essential competencies of an Information professional working in a digital library environment, from the perspectives of Norwegian and Thai LIS educators. The comparative study used online questionnaires, face-to-face interviews, online interviews and email interviews as data collection methods. The findings of this study revealed that the knowledge and skills that underpin the work of information professionals in both countries encompassed analytical, creative and technical competencies. It was found that the principal areas of discipline knowledge required included an understanding of metadata, database development, database management systems and user needs. Communication, critical thinking, information literacy and teamwork were found to be the generic skills needed by information professionals in a digital library environment.

As presented in the related studies, most of researches mentioned the skills and competencies which can be classified as personal skills, generic skills, and discipline-specific knowledge.

Methodology

This study employed a method research which includes qualitative research approaches. In the study, the content analysis methodology was used to review the literature with concept on skills and competencies of LIS professionals working in a digital era. The related literature was studied over a 14 year time frame from 1997 – 2010. The data was collected from analyzing, quantifying, classifying and summarizing the required skills and competencies which were mentioned or described in most of the literature.

A data analysis described the key skills and competencies of a new generation of LIS professionals, classified into 3 categories, namely personal skills, generic skills, and discipline-specific knowledge.

Key skills and competencies of a new generation of LIS professionals

Personal skills

Personal skills can be defined as appropriate attitudes, values and personal traits. (Khoo, 2005, p. 6)

The personal skills required for a new generation of LIS professionals include being analytical, creative, technical, flexible, reflective, able to deal with a range of users, detective-like, adaptable, responsive to others' needs, enthusiastic and self-motivated are central to library work (Table 1 and Table 2). Being analytical and able to use management tools such as PESTLE (Political, Economic, Social, Technological, Legal, Environmental) and SWOT (Strengths, Weaknesses, Opportunities, and Threats) are paramount. Technical skills also play a key role in library work.

Table 1: Description of personal skills

No.	Personal skills	Description
1	Analytical	using or skilled in using analysis (i.e., separating a whole-intellectual or substantial-into its elemental parts or basic principles).
2	Creative	having the ability or power to create.
3	Technical	of or relating to technique or proficiency in a practical skill for instance acquisition, classification, cataloging, management, services, etc.
4	Flexible	capable of being changed; elastic: able to adjust readily to different conditions.
5	Reflective	be devoted to matters of the mind; " the reflective type".
6	Able to deal with a range of users	eligible to provide or give the information and services to the variety of user groups' desired or needed.
7	Detective-like	able to solve a mystery, generally through a process of discovery.
8	Adaptable	capable of adapting (of becoming or being made suitable) to a particular situation or use.
9	Responsive to others' needs	answering, replying or responding; able to receive and respond to external stimuli. Susceptible to the feelings of others.
10	Enthusiastic	having or showing great excitement and interest .
11	Self -motivated	be motivated to achieve something due to one's own interest.

(Wikitionary, 2011; WordNet, 2011)

Table 2: Personal Skills required by a new generation of LIS professionals

Personal Skills	Feret & Marcinek (1999)	Goulding et al. (1999)	Lynch & Smith (2001)	Kwasik (2002)	Lovato-Grassman (2003)	Partridge & Hallam (2004)	Myburgh (2005)	O'Connor & Li (2008)	Orme (2008)	Howard (2009)	Nontha cumjane (2010)
1. Analytical	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2. Creative	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3. Technical	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4. Flexible	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
5. Reflective	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
6. Able to deal with a range of users	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7. Detective –like	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
8. Adaptable	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
9. Responsive others' needs	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
10. Enthusiastic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
11. Self-motivated	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Generic skills

Generic skills can be defined as the general skills which cut through disciplines for example communication, critical thinking, information literacy, teamwork, etc. (Khoo, 2005, p. 6)

The generic skills that are respectively required are as follows: information literacy, communication, critical thinking, teamwork, ethics and social responsibility, problem solving and leadership. In today's digital environment, it is important to note that a LIS professional serves many roles: a helpful facilitator in searching and evaluating required information; an effective communicator with commands in speaking, writing and presentation; a critical thinker updating the fast pace of digital era; a collaborative practitioner in problem solving with leadership qualification (Table 3).

Table 3: Description of generic skills

No.	Generic skills	Description
1	Information literacy	<p>a mean to “empower people in all walks of life to seek, evaluate, use and create information effectively to achieve their personal, social, occupational and educational goals.” (Horton & UNESCO, 2008, p 18)</p> <p>In this LIS context, “IL can be defined as ability to recognize when information is needed and being able to locate, evaluate and use effectively the needed information.”</p>
2	Communication	“the ability to exchange feelings, ideas and information with others in an appropriate manner. Communication consists of the two key aspects of oral and written skills. Oral communication involves using the human voice to effectively articulate a message to an intended audience. Written communication involves using text or graphics to effectively transmit a message to an intended audience.” (Partridge & Hallam, 2004, p. 19)
3	Critical thinking	“the ability to reach conclusions through reflection and evaluation by applying independent thought and informed judgement.” (Wolinski, 2010, p. 20)
4	Teamwork	“the ability to work effectively with others in a group with the view to achieving defined goals. Two distinct roles necessary for teamwork are the team member and the team leader. A team member makes a productive contribution to the collaborative effort of the group by participating in the pursuit of group goals under the guidance of the team leader. The team leader makes a productive contribution to the collaborative efforts of the group by providing guidance to ensure desired goals

		are met.”
5	Ethics and social responsibility	“an awareness of the need for and commitment to the maintenance of high professional standards and social justice.”
6	Problem solving	“the ability to find effective solutions to problems through creative reasoning.”(Partridge & Hallam, 2004)
7	Leadership	“a relationship that involves the mobilizing, influencing, and guiding of others toward desired goals.” (Wolinski, 2010)

Table 4: Generic skills required by a new generation of LIS professionals

Generic Skills	Feret & Marcinek (1999)	Goulding et al. (1999)	Lynch & Smith (2001)	Kwasik (2002)	Lovato-Grassman (2003)	Fisher (2004)	Partridge & Hallam (2004)	Myburgh (2005)	Choi & Rasmussen (2006)	Gerolimas & Konsta (2008)	O'Connor & Li (2008)	Orme (2008)	Choi & Rasmussen (2009)	Howard (2009)	Nontha cumjane (2010)
1. Information literacy	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2. Communication	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3. Critical thinking	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4. Teamwork	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
5. Ethics and Social responsibility	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
6. Problem solving	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7. Leadership	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Discipline-specific knowledge

Discipline-specific knowledge can be defined as knowledge which is learned in the LIS programmes in both undergraduate and postgraduate levels, for instance collections development, digital library architecture, digital library software, metadata, etc. (Choi & Rasmussen, 2006; Howard, 2009)

The discipline-specific knowledge which is required for the new LIS professionals includes metadata, database development and database management system, user needs, digital archiving and preservation, collection development, and content management systems (Table 5). The present paper depicts the three most required qualifications. Metadata, which is a core theme of LIS work, enables LIS professionals to create linking of accessible data. Database development and database management systems are required to strategically and technically manage databases. User needs can help in user analysis to appropriately serve specific groups.

Table 5: Discipline-specific knowledge required by a new generation of LIS professionals

Discipline-specific knowledge	Tennant (1999)	Kwasik (2002)	Lovato-Grassman (2003)	Partridge & Hallam (2004)	Choi & Rasmussen (2006,2009)	Howard (2009)	Nonthacumjane (2010)
1. Metadata	✓	✓	✓	✓	✓	✓	✓
2.Database development and DBMS	✓	✓	✓	✓	✓	✓	✓
3.User needs	✓	✓	✓	✓	✓	✓	✓
4.Digital archiving and preservation	✓	✓	✓	✓	✓	✓	✓
5.Collection development	✓	✓	✓	✓	✓	✓	✓
6.Content management system	✓	✓	✓	✓	✓	✓	✓

Conclusion

The findings of the study provide a complete picture of an archetypal set of skills and competencies which build the image of a new generation of LIS professionals. Due to digitization of the knowledge-based society, libraries are faced with many kinds of changes with regard to technological aspects, user and learning behaviors, and social aspects. All have major impacts on the roles, competencies, skills and knowledge of LIS professionals. This paper identifies the primarily required personal skills as analytical, creative, and technical. It can be confirmed by the studies of Feret & Marcinek (1999); Goulding et al.,(1999); Lynch & Smith (2001); Kwasik (2002); Lovato-Grassman (2003); Partridge & Hallam (2004); Myburgh (2005); O'Connor & Li (2008); Orme (2008); Howard (2009); Nonthacumjane (2010). All of these traits can be applied to deal with the changes mentioned because a new generation of LIS professionals has to be analytical to use tools such as PESTLE or SWOT on collections, users, technological aspects, etc. Creativity is also required to deal with the changes in collections, services, and users. Technical competency is also needed because

although working in the digital library is quite similar to the traditional one, it is totally dependent on technical equipment in its execution. Additionally, the personal skills which are required for a new generation of LIS professionals include being flexible, reflective, able to deal with a range of users, detective-like, adaptable, responsive to others' needs, enthusiastic and self-motivated. Besides, answering such questions can help fulfill the library mission.

To provide information that suits user demands, information literacy, communication, critical thinking, and teamwork are the most required generic skills. In this digital era, the representative of a new generation of LIS professionals should be a person who is able to act as facilitator or mentor to help the user to find the information needed and to evaluate it. Thus, information literacy skills are needed which again is supported by many studies (Feret & Marcinek, 1999; Goulding et al., 1999; Lynch & Smith, 2001; Kwasik, 2002; Lovato-Grassman, 2003 ; Fisher, 2004; Partridge & Hallam, 2004 ; Myburgh, 2005; Choi & Rasmussen, 2006; Gerolimas & Konsta, 2008 ; O'Connor & Li, 2008 ; Orme, 2008; Choi & Rasmussen, 2009 ; Howard, 2009; Nonthacumjane, 2010). Communication is quite important to work efficiently in the digital era, as oral, written or presentation skills are needed to maintain contact between the library staff themselves and users. Additionally, the new generation of LIS professionals will encounter numerous changes, so that critical thinking, ethics and social responsibility, and problem solving skills are vital. Teamwork is one of the key skills to work in a combination of several practitioners working in multidisciplinary groups representing a variety of professional areas such as Computer Science, Information Science, Journalism, etc. Consequently, they should have leadership skills and know how to work as a part of a team. They should understand the importance of effective collaboration so that the group can fulfill projects successfully and achieve the goals of the library as well.

In order to perform the main professional work successfully, the discipline-specific knowledge was studied. Metadata, database development and database management systems, user needs, digital archiving and preservation, collection development, and content management systems were mentioned as the most essential discipline-specific knowledge. The findings can be confirmed by several studies. (Tennant, 1999; Kwasik, 2002; Lovato-Grassman, 2003; Partridge & Hallam, 2004; Choi & Rasmussen, 2006; Choi & Rasmussen, 2009; Howard 2009; Nonthacumjane, 2010). Metadata tops the list of required LIS knowledge, so it is reasonable to argue that metadata represents a core theme of LIS basic knowledge for a new generation of LIS professionals, especially in this digital era. The LIS professional roles involve knowing how to create linking data that makes data in digital form. Additionally, they need to know how to do content management, retrieving, sharing and preserving digital information to serve the user with easy accessibility.

To work successfully in the digital library environment, it is indicated that a new generation of LIS professionals should have a basic knowledge of database development and database management systems, which is also noted as one of the most essential required items of knowledge. The organizational issues are all connected to database knowledge, such as Functional Requirements for Bibliographic Records (FRBR) which is based on database design, the Semantic web, Resource Description Framework (RDF) and the SPARQL query language, and related principles and technologies.

The area of user needs is also mentioned as essential knowledge that an information professional should have. In the digital library, the main task is similar to the traditional one, in providing information and knowledge services to users. User needs represent the highlighted topic that an information professional should understand in depth. LIS professionals have to identify who is the target group or user of the library, for instance as the

digital natives or the digital immigrants, etc. They have to find out or do research on what the user demand might be in order to answer questions like:

What kinds of services do users really need?

Does the collection meet their needs?

Are they satisfied with the collections or services provided?

Digital archiving and preservation; collection development, and content management systems are also mentioned as areas of essential knowledge in which the new generation LIS professionals should be qualified. In this era, digitization makes a major impact on the library collections. Thus, it is the required knowledge for the LIS professionals to deal with and manage these collections.

In conclusion, to work efficiently and effectively in the fast-changing digital age, a new generation of LIS professionals should have the qualifications in providing information as well as dynamically exercising personal skills, generic skills and discipline-specific knowledge.

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