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## Abstract

Electronic information services and the competencies required for providing them are defined. The personal, basic, general, and special competencies that will be needed are described. Both how the competencies are acquired initially and how they will be maintained thereafter (as well as responsibilities for gaining and maintaining competencies) are also discussed.

### 1.0 Introduction

There are a number of factors having an impact on today's libraries, one of the most important and pervasive of them being technology. [1] Like it or not, the future of our libraries depends on this technology--it is dictating or influencing how our information is acquired, organized, stored, retrieved, and disseminated; how our services and facilities are designed, organized, staffed, and offered; and how our users seek, receive, and use information. Technology also is altering our philosophy from that of collecting information to providing access to information; it is affecting our policies and procedures; and it is requiring that librarians have skills and knowledge unprecedented in our past. No aspect of our services, facilities, or other resources is or will be unaffected by technology.

Librarians are now faced, as never before, with the never-ending struggle to attain and retain the competencies needed to remain productive in their careers, thanks to a great extent to technology. The obsolescence of skills and knowledge is directly related to advances in technology, and those advances are occurring at a mind-boggling rate.

This paper is about the specific competencies needed for electronic information services, how the competencies are acquired and maintained, and responsibilities for acquiring and maintaining those competencies.

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### 2.0 Definition of an Electronic Information Service

An electronic information service is any library system whose primary purpose is to provide access to, reference from, or otherwise utilize information from one or more databases stored electronically on online data storage media such as magnetic disk or optical disc. The stored information could be bibliographic or citation records, abstracts, full-text documents, numerical data, image records, sound records, inventory records, personnel records, financial records, or any other type of records that can be stored in digital form.

Access to this information is under the control of one or

more computers, using nearby or distant microcomputer or other input/output terminals. The information and the computer or computers that control it may be in the library, in a computing center serving the library, or in a nearby or distant organization with which the library has cooperative or contractual agreements. The library may own or control all the information, part of it, or none of it. Although many information seekers may never physically enter the library building, a large number probably will, at least for many years to come, to use its terminals and other facilities and to receive human assistance or companionship. Also, for many years to come, most libraries must cope with information in both electronic and traditional formats. So, until all of a library's information is in electronic form, its electronic information services must retain links to non-electronic information handling systems, particularly when document delivery is involved. The demand for information available only in traditional formats will continue far into the electronic information age, until some unknown point in time, if ever.

Common examples of electronic information services providing direct services to library clients include mediated searching of remote databases, end-user searching of remote databases, and end-user searching of local databases, including online public access catalogs, CD-ROM citation databases, and community information files. Examples of other electronic information services providing indirect or internal services include acquiring or creating information in electronic databases, organizing and preserving electronic information, and providing information and services to library management and staff as well as to external governing authorities and agencies. There is a commonality of competencies that are, or will be, required in providing any of these electronic information services.

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### 3.0 Definition of a Competency

The definition of a competency is controversial. In earlier times (a decade or so ago), competence was considered in terms of the personal characteristics one had; competence was judged on the basis of the quality of one's character, virtue, innate abilities, and underlying attributes. Today, however, competence is considered more in terms of skill-oriented behavior and observable actions measured against quantitative standards; one's competence is judged on the basis of whether or not learned mental and physical tasks can be performed. Current thinking of many is that competency can be taught, and competency can be measured.

One current definition is that a competency is having the capacity, skills, and knowledge to function in a particular way; another is that a competency is what a person knows; while still another is that a competency is evidence that one can produce desirable outcomes. For this paper, a concatenation of these definitions will be used; that is, a competency is defined as a personal characteristic or trait, or what one should know or what one should be able to do in order to achieve a desirable objective or outcome. Fundamentally, competencies are not aspects of jobs in electronic information services, but rather characteristics of those who do the jobs best.

### 4.0 Types of Competencies Needed

It is appropriate to put all the competencies for electronic information services into one list. But in this paper they are separated into four groups: personal characteristics, basic skills, general knowledge, and special knowledge. If it is felt that this separation is not necessary, then the separate lists can easily be merged into one, or separated into different groupings.

#### 4.1 Personal Characteristics

The first grouping is of personal characteristics. A personal characteristic is a character virtue or trait of a person. I am not a medical doctor, a psychologist, or a learning specialist, so I can only surmise that most character traits are innate within one, or at least taught and nurtured within one at an early age. Probably, some traits can be learned, or at least improved upon, through formal education and training, exposure to others, and experience. There are seven personal characteristics for electronic information services on this list. They are in no particular order of importance.

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##### 1. A Service Attitude

A service attitude is important because a sincere and enthusiastic desire to help others in their quest for information is needed if quality services are to be given and if one is to be competent in this type of job. Being user oriented requires one to be unselfish with one's knowledge and talents in the effort to assist others in identifying, locating, receiving, and evaluating information that meets their needs. It is the satisfaction or reward when that has been accomplished successfully. It also is the desire to improve and do better the next time when one fails to satisfy a client.

##### 2. Effective Interpersonal Communication Ability

Effective interpersonal communication skills are critical because the ability to listen effectively and to respond to others with clarity, ease, warmth, openness, patience, and empathy is also essential to providing quality services and can mean the difference between being able to achieve successful outcomes when serving clients through electronic information services and failure to do so. This also includes the ability to explain services, policies, and even information easily and coherently to clients and others.

##### 3. Social Sensitivity

Social sensitivity is essential when serving different sorts of people. One must, with grace and ease, equally serve people with differing information needs, levels of background and knowledge, communication abilities, cultural characteristics, and mental and physical abilities or disabilities. Each person must be served with equal enthusiasm and with the same assumption of importance as the last.

#### 4. Flexibility

Flexibility is needed to adapt easily to the variability between the information needs of differing clients, between the differing ways of identifying, locating, and transferring information, and between the changing requirements of users. Being able to move easily and quickly from one situation to another is important, whether it be working directly with clients or behind the scenes.

#### 5. Time Consciousness

Time consciousness is essential when providing timely services, particularly when a service is heavily used and one is rushed to serve a number of clients rapidly or simultaneously. While one must serve each person equally, one must organize one's time effectively and not spend inordinate amounts of time on some assignments to the detriment of others that might be just as important.

#### 6. Curiosity

Curiosity is important because a wondering mind is always essential when seeking information, whether it is for oneself or for clients. Having curiosity enables one to use an electronic information service with the anticipation that something new will be learned, even though you are helping other people rather than yourself. Being curious also enables one to try new approaches to locating information or to investigate new possible sources of information. Having curiosity also makes life much more interesting.

#### 7. A Desire to Perform Well

Finally, a desire to perform well is a sign of someone who is unwilling to give poor service or produce shoddy work, and who wants to do their best day in and day out, regardless of the assignment or the conditions. This characteristic is important to quality service and to quality job performance.

Other personal characteristics, such as self confidence, judgement, team participation, and honesty, could easily be placed on the list also. Sufficient examples have been provided to give a sense of what is needed for effective electronic information services.

#### 4.2 Basic Skills

The second group of competencies is the basic skills that one needs in order to work effectively in electronic information services. Basic skills involve the use of one's knowledge and abilities effectively and readily to execute or perform specific learned mental and physical tasks with dexterity and coordination. There are four particular basic skills on this list for electronic information services. Again, they are not in any particular order of importance.

## 1. Information Analysis and Evaluation Skills

High on the list of basic skills is capable information analysis and evaluation skills. Skill at determining the precise information needs of library users, summarizing or translating their needs into strategies for identifying and locating needed information, and analyzing and evaluating the retrieved information to determine whether or not it meets the needs of clients is essential if service outcomes are to be acceptable. Without these skills, incorrect information can be retrieved, resulting in dissatisfied clients.

## 2. Computer Use Skills

Also high on the list of basic skills is effortless computer use skills. One should be able to use a computer with confidence and ease, to the extent that clients and others are not able to observe nervousness, timidity, hesitation, or tenseness on your part when you are handling the equipment or using systems. For example, one:

- A. Can log onto, adjust, log off, and turn off a standard computer terminal, or boot a microcomputer, react correctly to software prompts and messages, and shut down the systems safely and correctly after use.

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- B. Can use the cursor control keys, the numeric keypad, and other special keys such as the function keys, control, escape, and alternate, with facility.
- C. Can locate and retrieve files or software in storage.
- D. Can touch type with a reasonable data entry speed (say, 50 wpm).

## 3. Network Use and Navigation Skills

Also on the list of basic skills are effective network use and navigation skills. For example, one:

- A. Can enter, move about in, utilize features of, and exit a local area network, BITNET, or the Internet.
- B. Can handle modem and other communications equipment and communications software and can connect and disconnect from the public-switched network, value-added networks, and other specialized telecommunications links.

These skills are essential when communicating electronically with clients, identifying and locating requested information through networks, transferring

information around networks and into the library, and delivering information to clients. Most electronic information services of tomorrow, and even many of today, will rely on a blend of information stored in local databases as well as in databases located anywhere around the world.

#### 4. Word Processing Skills

Good word processing skills are also essential. One should know at least one standard word processing system, such as WordPerfect. This is fundamental to understanding and using electronic mail systems and in preparing other online communications with clients, staff, and others, and other systems where information is created and/or manipulated.

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#### 4.3 General Knowledge

The third category of competencies for electronic information services is general knowledge, which is defined as an understanding of general facts, principles, and other information not specific to providing electronic information services, but nonetheless essential background knowledge needed in order for someone to best perform that job. Remember, however, that competence is not based on the knowledge one has, but on how that knowledge is applied to electronic information services. This general knowledge is not specific to any particular institution, library, or any job.

An endless number of competencies can be placed in this category, but twelve of the most important for effective electronic information services will suffice for this paper, again in no particular order of importance.

##### 1. The Nature and Creation of Information

On the list of general knowledge is an understanding of the nature and creation of information. This includes the principles of what constitutes information, representation of information for machine acceptance, the various types of information, the sources of information, the various formats in which information can be found, and the process of creating or generating information. This background knowledge can be useful when dealing with any aspect of an electronic information service.

##### 2. Information Storage and Retrieval

An understanding of the general principles, techniques, and methods of information storage and retrieval is on the list of general knowledge essential for electronic information services. This includes the process of entering information into files; the various ways that information can be organized in storage; cataloging, indexing, and abstracting of information for storage and retrieval; query formulation and execution; relevance of retrieved information; security of information in storage; and the processes involved in

information storage and retrieval.

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### 3. Information Transfer

An understanding of how information is communicated, interchanged, or transferred from one individual to another and from one computer site to another is essential. This includes the forms in which information can be transferred, the various methods for information transfer, the equipment needed for information transfer, and the common communications links that are used in the process.

### 4. Information Networks

Closely related to the previous item is an understanding of the principles of information networks, which are the communications links that are cooperatively organized and maintained between libraries and other organization for the purposes of sharing informational resources and transferring information. An understanding of why people and organizations need to cooperate, why cooperation underlies networks and networking, the benefits and limitations of cooperation, how networks are organized and utilized, and the politics and economics of networks and networking is important to understand some of the mechanisms for electronic information services.

### 5. Information Systems

Knowledge of the basics of information systems within libraries and other organizations is next on the list. This includes an understanding of what systems are essential, their goals or purposes, their essential components or elements, and how they work or don't work. This also includes the application of computers and other technology in support of information systems.

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### 6. Information Policy

An understanding of information policy on international, national, state, and local levels is critical. This includes official, semi-official, or unofficial policies regarding how information is generated, retained, disseminated, and accessed, including who has access to information. This knowledge will be helpful when identifying, locating, and accessing information and when answering clients' questions about the availability of information, how information can be used, and why some information cannot be obtained or obtained easily.

### 7. Information Copyright and Related Issues

Also essential is knowledge about information copyright and related issues. Copyright and related legal rights

and privileges of information creators, publishers, performers, and owners are some of the most pressing problems facing us in the electronic information age. Until we can solve some of these problems, electronic information services will be restricted in many different ways, particularly when accessing information in other libraries. This knowledge is useful when dealing with everything from designing to managing these services.

#### 8. Information Privacy and Ethics

Knowledge of information privacy and ethics is essential when providing or using electronic information services. This includes the basic laws underlying the rights of individuals to privacy and how that relates to providing electronic information services. The fear that someone is monitoring everything we transmit using electronic information systems is a troublesome issue that can restrict the free flow of information, particularly when dealing with controversial information.

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#### 9. Computing

Knowledge of the general principles of computing is next on the list. This would include an understanding how computers work, their capabilities and limitations, and their role in electronic information services. Understanding how computers store, retrieve, process, and communicate information underlies all activities to do with electronic information services, including the use of information networks.

#### 10. Organizational Theory

Also on the list is an understanding of the basic principles of organizational theory, because knowledge of how organizations are organized, staffed, and managed gives insight into how they work. Knowing this can help in maneuvering through the intricacies of one's own library and of other institutions when seeking information or working with electronic information services.

#### 11. Information Standards

Knowledge of the standards affecting the indexing, transfer, and other aspects of handling information and of the technology and communications facilities that are used is helpful when working on a daily basis with electronic information services. The reasons why electronic information systems are organized or operated lie in the desire to adhere to acceptable standards that make our systems universally compatible, or as compatible as possible.

#### 12. Information Technology Trends



Last on the list of general knowledge essential for electronic information services is an understanding of information technology trends. What new ways of storing and transferring electronic information are under development? What emerging technologies possibly might affect the library and its electronic information services in the near or distant future? This knowledge can be helpful in keeping the perspective that electronic information services are constantly evolving, and that change and managing change is a part of electronic information services.

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#### 4.4 Specialized Knowledge

The final category of competencies is the specialized knowledge needed for specific electronic information services being offered, which is expected of a specialist in the particular area of librarianship. There are ten competencies on this list, again in no special order.

1. The Clients With Which One Works and Their Information Needs

A good working knowledge of the clients with which one works and their specific information needs is important. This includes knowing what types of information clients need, the nature of that information, when they want the information, and how they want it delivered. This also includes their thoughts on what information should be permanently retained locally and what can be obtained at the time of need from other libraries and information centers.

2. The Clients' Discipline(s) and Relevant Literature

Knowledge of the clients' discipline or disciplines and its literature is essential. If one does not have formal training in the same discipline as one's clients for an electronic information service, then one certainly must have a good working knowledge of the field and its literature, to give one credibility when working with the clients. Someone without the proper credentials might not be readily accepted by clients.

3. The Specific Electronic Information Service Being Offered

One should have a thorough understanding of the specific electronic information service being offered. One must understand the purpose or function of the service, its goals and objectives, the nature and scope of information in its database, how the information is organized, how the information is retrieved, how the service is organized and managed, how the results can be delivered, the procedures and policies for its use, and a little about its history. This also might include knowledge of the licensing agreement for the service and the economics of its purchase or licensing and other associated costs.

4. Use of the Specific Electronic Information Service With Which One Works

Closely related to the previous special competency is a facility in using the specific electronic information service with which one works. One must be able to use the service with ease, to explain its use to others, and to assist others in its use. This is at the heart of special knowledge. Clients will forgive you for not knowing their discipline, if only you can obtain information for them or help them in obtaining information.

5. Other Electronic Information Services That Supplement or Complement the One Being Offered

Knowledge of other electronic information services that supplement or complement the one being offered also can be very helpful, since it probably is not typical for any one electronic service to yield all the information clients want in every case.

6. What Resources Are Available Locally

One must know what information resources are available locally when using an electronic information service. All or most of the information retrieved for clients from an electronic information service might be deliverable from in-house or external computer files. But probably for many years to come, the demand for information available only in traditional print format will continue. That demand will gradually diminish until it reaches zero or comes close to zero at some unknown future point in time. In the meantime, one must still know what resources are available locally.

7. Where and How to Obtain Resources Not Available Locally

But still, one must know where and how to obtain resources not available locally. While there are software systems that assist in locating information in electronic databases around the world, use of these systems must always be supplemented with personal knowledge of additional sources or acquaintance with people who know where information can be located.

8. Document Delivery Options

Knowing local document delivery options is also important. One must know what options are available to clients, how they work, how to use them, and their costs.

9. Evaluation of Information Received From an Electronic Information Service Being Offered

Knowing how to evaluate information received from an electronic information service being offered is becoming critical. Many clients are overwhelmed by the vast amount of information that an electronic information service can yield, and want a librarian to filter through it and pick out the important from the peripheral. The quality of service received, in the eyes of many clients, might be how well the librarian selected the information that is given them.

#### 10. Evaluation of the Satisfaction of Clients With an Electronic Information Service

The final type of special knowledge is how to evaluate the satisfaction of clients with an electronic information service. This is, of course, related to the previous competency. Satisfaction can be evaluated through use of formal and informal interviews, questionnaires, and surveys.

### 5.0 How Competencies Are Acquired and Maintained

Having a degree from the most prestigious library school in the country does not necessarily or automatically ensure competency for electronic information services. The necessary competencies most likely will be acquired from a combination of sources, only one of which will be library school. Responsibility for acquiring and maintaining competency for work in or with electronic information services has to be a shared one.

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#### 5.1 Formal Education and Training Programs

First, competency for electronic information services can be obtained through formal education and training programs. Completion of a formal education and/or training program leading to a certificate or degree is one way of initially acquiring basic skills, general knowledge, and some specialized knowledge. This could include high school, technical school, community college, and senior college or university degree programs. Sometimes, these same institutions offer refresher courses or programs designed to upgrade skills and knowledge once a certificate or degree is earned. Information is usually presented in an organized and succinct manner designed to facilitate learning; the opportunity to interact within a group of peers is provided; and evaluation of knowledge gained is evaluated through testing.

It is usually the responsibility of the individual to want to gain competency using this approach and to initiate and complete the process. However, a library can give unpaid leaves of absences for its employees to complete a formal program on a full-time basis and/or allow employees opportunities to set flexible work schedules in order to attend classes. Of course, many employees attend classes at night and on weekends in order to complete a formal education or training program, either for an initial professional degree or to upgrade or gain new skills and knowledge.

#### 5.2 On-The-Job Training

All skills and knowledge learned through formal education and training programs must be reinforced and enhanced through on-the-job-training. Also, most of the specialized skills for electronic information services will most likely be learned on the job, and one's initial orientation and subsequent on-the-job training before one begins work with a service is one of the primary ways competencies are gained. It is the responsibility of the library to provide initial on-the-job training for electronic information services and follow-up training when necessary.

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### 5.3 Self Education

Self education when acquiring and maintaining competencies for electronic information services should not be overlooked. By studying textbooks, training and reference manuals, procedure and policy manuals, and other documentation, one can learn the basics of an electronic service. This must be followed up with, or accompanied by, other methods such as experience if it is to be effective.

### 5.4 Apprenticeship

Coupled with on-the-job training and self education is apprenticeship with a colleague or a mentor who is assigned, or assumes, responsibility for working with someone new to an electronic information service. This person can provide the initial and follow-up training, then enable one to master a job under his or her tutelage. The person can correct one's mistakes, provide a model for good work habits and proper techniques, and reinforce the learning experience. This technique has been long neglected in this country, but it still is a viable way of learning, even in this electronic age. There can be a formal apprenticeship program that is official policy of a library, or it can be completely voluntary on the part of the mentor and the apprentice.

### 5.5 Experience

Experience is one of the best teachers when learning or acquiring competency for electronic information services, based upon one or more of the other approaches just mentioned. One will never be truly competent in an electronic information service until this experience is gained. Through experience, one gains self confidence, agility, and speed and begins to add to one's effectiveness in a job.

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### 5.6 Continuing Education Events

Many skills and some knowledge learned through formal programs tend to become rapidly obsolete when dealing with electronic information services. Continuing education provides one of the best ways of upgrading skills and knowledge as well as of keeping abreast of trends and issues in the field. Continuing education events include workshops, seminars, short courses, demonstrations, and other presentations where one can learn new skills and knowledge and upgrade or enhance old skills and

knowledge. Continuing education is a joint responsibility of the library and the individual. The library must either design and provide the events, or provide opportunities to its employees to attend events, either at full or partial library expense.

## 6.0 Conclusion

In conclusion, anyone who expects to manage, use, or provide services from an electronic information service effectively must have a number of competencies, including some personal characteristics, some specialized basic skills, general knowledge that provides a base for the services, and some very specialized knowledge directly related to services that are offered. These competencies will be acquired in a variety of ways, and most of them must be updated continually if one is to remain an effective employee. Responsibility for acquiring and maintaining the competencies in tip-top shape will be a shared responsibility between the individual, the library in which he or she works, and multiple external organizations such as professional societies and associations, consortia, vendors, and others. Those of you who neglect the maintenance of your competencies, or acquiring them in the first place, will find yourself being less effective on the job.

## Notes

1. This paper was presented at the Ninth Texas Conference on Library Automation, Houston, Texas, 2 April 1993.

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