Department of Information Science

Learning how to provide reference services



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Only study guide for

AIS2602

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OVERVIEW: ORIENTATION

Introduction

This is your study guide for Module AIS2602 which is about reference services. Before you begin learning about reference work we take a few moments of your time to inform you about what you can expect in this study guide. We also explain how to use the study guide and how to plan your studies. In addition, we advise you on familiarising yourself with the reference services of a library, consulting the reference collection and making use of the access facilities.

Finally we provide terminology that is used in this module and needs clarification.

1.1 USING THE STUDY GUIDE

This study guide has two distinct purposes:

(1) **It acts as study material**. This study guide contains the information you need for this module. You will also find it very helpful to regularly consult your prescribed textbook for Module AIS1503 (Behrens, SJ. 2000. *Bibliographic control and information sources*. 3rd edition. Pretoria: University of South Africa and the recommended books that will be included in Tutorial letter 101 for this module). With reference to the assignments based on this study guide, we have provided more information in Tutorial letter 101 for AIS2602.

(2) **It contains exercises**. This study guide also functions as a workbook by providing exercises for you to work through. Most study units have several activities. Blank spaces are provided for you to make notes or answer the questions. The activities provide you with an opportunity to carefully reflect on what you have learnt about reference work in each study unit and to put your views in writing. The exercises are relevant to the specific study unit; but you will also gain insight from other study units you can use when answering the questions. Answers to the exercises are provided at the end of each study unit. The exercises are an important part of your studies. They enable you to apply in practice what you have learnt in theory.

This study guide is divided into the following three broad parts, referred to as topics:

TOPIC 1: INTRODUCTION TO REFERENCE SERVICES

TOPIC 2: SEARCHING FOR INFORMATION

TOPIC 3: EVALUATING REFERENCE SOURCES AND SERVICES

In the first part (topic 1) we focus on the basic and general aspects of a reference service: what it entails, why it is rendered, how it is rendered, who renders the service and important current trends. In the first study unit we introduce you to the personal assistance component of reference services and how reference services can be organised and implemented; in the second study unit we discuss the role of the reference worker and in the third study unit we discuss the impact of the internet on reference services.

The second part (topic 2) focuses on the practical skills required in the process of offering reference services. Searching for information to answer reference questions is one of the most

important activities of reference services. The ability to search for information effectively to save the reference worker and the enquirer time and effort depends on these skills. In order to do this, it is important that you understand the reference query through an interview process (explained in study unit 4). It is also necessary to have a search strategy (discussed in study unit 5) to be able to conduct a manual search or an online database search (study unit 6) or an internet search (study unit 7).

The third part (topic 3) focuses on quality control issues: evaluation of the sources, tools and the entire reference service to ensure that users are provided with a high quality service. Although evaluation activities are mainly the responsibility of the managerial staff of an information service, all the information professionals, especially the reference workers, should be aware of the quality of reference sources and services provided. Every reference worker should be able to judge the suitability of reference sources (study unit 8) by applying specific criteria. The entire reference service in an information service also needs to be assessed regularly in order to check the quality of the service that is being provided. In study unit 9, you learn about the different aspects of the reference service that should be evaluated for reference personnel to orient themselves to the reference environment, understand what causes pressure and a heavier workload; and respond to current demands in an effective way.

1.2 LEARNING OUTCOMES FOR THIS MODULE

On completion of Module AIS2602, you will have achieved the following specific learning outcomes:

(1) You should be familiar with and understand the:
- basic concepts of reference services
- role of the reference worker (your future role) in reference services
- impact of information and communication technology (especially the internet) on reference services
- current trends affecting reference services
- reference processes and sub-processes: the reference interview and the search strategy
- difference between manual searching, online database searching and internet searching
- evaluation of different sources, resources and the aspects of reference services

(2) You should be able to:
- conduct a structured reference interview
- plan a search strategy for manual, online database and internet searches
- conduct searches in printed material, electronic sources and on the internet
- apply specific criteria to evaluate different types of reference sources
- evaluate different aspects of a reference service

(3) You should be able to think critically about issues that may influence the provision of an efficient reference service.

As you study the different study units, it would be useful to assess yourself along with these outcomes. For example, at the end of study unit 1, ask yourself "Do I know what the different reference processes are?", "Can I explain the basic concepts of the reference service?" and so forth.

1.3 RELATIONSHIP TO OTHER MODULES

It is important for you to be aware of how Module AIS204K links up with the other modules in Information Science and Applied Information Science (AIS) at the first, second and third levels of study in the Department of Information Science.

In the first-level modules in Applied Information Science: AIS1501, AIS1503 and AIS1601, you studied several information agencies and their activities. Two main functions of most of these information agencies are: to make information and information sources accessible and available to the users. The information materials contain information and tools that enable people to access and communicate information. Therefore, you know that information agencies undertake several activities and use information sources and ICT tools in order to perform these functions.

You had two first-level modules in Information Science (INS), namely:

- INS1501: Personal information retrieval – this module covered aspects such as information science as a scientific field of study; an introduction to information sources, services and technology; and personal information skills.
- INS1502: Information literacy – this module introduced you to the basic theory on the nature of information and the information society; and accessing, evaluating and using information.

In this way, the first-level modules in Information Science and Applied Information Science provided you with background knowledge that can be put to good use in your studies of reference services. You should apply the knowledge to your second-level studies and build on it as you learn about reference services and other aspects of information work. In addition to Module AIS2602, the second-level modules for Applied Information Science include:

- AIS2601: Bibliographic control and basic descriptive cataloguing – which includes the study of bibliographic control tools and how they are compiled and utilised to access publicly available information wherever it may be. The knowledge you gain through studying this module will enable you to utilise the reference sources in a reference service effectively. You will need this knowledge to interpret citations and to know how to access information effectively.
- AIS2603: Describing library user groups and meeting their needs – the focus is mainly on the users of information; the different categories or types of users, their respective contexts; their information needs and information usage behaviour. The purpose of this module is to equip students with the knowledge to understand their users so that they (the students) learn to select relevant information materials to support user services and meet the changing community information needs.
- AIS2604: Utilising electronic library systems and services – this module gives students a chance to understand the systems that are applied in automating libraries and to develop expertise in designing, using and evaluating databases. The students will also learn the use of document management systems for internal information enhancement and current electronic awareness services as a means of enriching service delivery.
- AIS2605: Developing and managing information collections – the focus of this module is on the management of information collections. Students will learn to manage and develop information resources competently according to user needs in a multimedia and electronic environment.

Please remember that all modules and knowledge are interconnected. Therefore, whatever you learn in one module can be used to understand another module better. Although we have tried to structure our modules so that the interdependence is minimised, you will find it beneficial if you can spot the interconnections.

In the third-level AIS modules, you will be introduced to advanced descriptive cataloguing and subject organisation, advanced verbal methods of information organisation and retrieval and user guidance. You will also learn about the different verbal methods of subject description such as title indexing, citation indexing, précis, pre-coordinate and post-coordinate indexing, and indexing internet resources. These modules will build on the first and second-level modules to extend your knowledge and skills in order to make you more efficient in your career.

You will be able to conduct advanced online searches on databases and on the internet for reference work. You are, therefore, introduced to relevant aspects of these topics in Module AIS2602 and to basic online search activities but will add to this in your third and final level of study.

1.4 PLANNING YOUR STUDIES

Since this is a second-level module, we presume that you already have experience of studying at Unisa and will know how important it is to plan your studies carefully. You already know how limited your time is to work through a module and prepare an assignment to be submitted before or on the due date. You will have to work regularly to keep up with your studies and must leave sufficient time to revise for the examinations.

The majority of basic information required for this module is in this study guide, but study unit 8 requires the use of a prescribed text (Behrens, SJ. 2000. *Bibliographic control and information sources*. 3rd edition. Pretoria: University of South Africa) that you already have, if you studied Module AIS1503. There is a list of sources you may find useful at the end of each study unit; especially if you need further clarification of concepts. We will also point you to a selected number of recommended texts and a reading list is incorporated in Tutorial letter 101 for AIS2602. An in-depth understanding of reference services requires that you consult more than one source. You can apply in advance for books and other sources from the library, but remember that time is limited and postal delays can occur. You have to plan carefully.

After you have taken all the factors into consideration, divide the work into the number of weeks you have and stay within the parameters of your study schedule if possible.

1.5 USING THE LIBRARY

Apart from using the library for obtaining study material, you have to familiarise yourself with the various functions and activities of a library in order to become proficient in using reference sources and the various facilities needed to access information.

If you are working in a library, we hope that you will have no difficulty in finding and consulting the different sources necessary for reference work. You should also ensure that you are assigned to the reference work section so that you can have first-hand experience of the concepts, practices and skills of reference work. Those students who do not work in libraries are expected to visit a nearby library for first-hand experience in personal assistance and the utilisation of reference sources. When visiting a library, observe, as closely as possible, how functions are performed and try to relate it to what you have learnt from your studies about reference services. Make notes of any shortcomings or positive points you become aware of while observing the reference environment. This will help you later when you have to evaluate reference services.

1.6 KEY CONCEPTS

Bibliographic control: Describing and listing sources that can be identified and located.

Bibliographic instruction: Activities that are designed to teach users how to locate and use information.

Database: A source in electronic form which requires the use of a computer.

End users: Usually refers to enquirers who access information on a database by themselves.

Enquirer: A person who makes use of a reference service to satisfy a need for information.

Information service: An agency, the main aim of which is to provide its users with information or sources of information; or access facilities to solve information-related problems.

Information skills: Ability to handle information.

Instruction: In the reference context; refers to personal assistance to users when they are using bibliographic control tools and accessing information in remote locations.

Manual search: Looking for information by hand in hard copy or microform sources (ie without using a computer).

Online search: Looking for information on a database by using a computer.

Personal assistance: Aid provided to individuals who utilise the reference service of a library or information service, also known as a one-on-one service.

Reference desk: Point in the reference area where the enquirer meets the reference worker to pose questions.

Reference service: A component of an information service or library where personal assistance is offered to users by providing reference sources (both printed and electronic) as well as personal advice and guidance from reference workers.

Reference work: Refers to the actual process of assisting users.

Remote location: Refers to information available outside the borders of the local library or information service.

Searcher: Refers to the reference worker or an end user who performs an online search.

Work station: A point of use in the reference area – usually a number of computer terminals where end users can access information online.

1.7 CONCLUSION

We trust that you will find the content of this module accessible and stimulating and that it will give you a positive perspective on reference work in times of change.

TOPIC 1

Introduction to reference services

In this section of the study guide we will discuss the personal assistance provided by information services to their user communities. In the past few decades, reference services have undergone dramatic changes as a result of information and communication technologies (ICT). Reference services have changed from material-centred services to client-centred services. However, the core focus still remains on the mission of the profession, namely making it possible for people to access information. Reference librarians are even referred to as 'mediators between the user and the information', as well as navigators of the information superhighway (Schement 2002:867).

In this section we start with an introductory unit which introduces you to the personal assistance component of reference services and how reference services can be organised and implemented. You will learn about the different varieties of reference services and the reference process. In the second unit we discuss the role of the reference worker you. The reference worker is the human interface between the user and information; and is responsible for providing an effective and efficient service to satisfy users and to promote respect for a high quality service. As long as reference workers assess their environment, keep abreast of the needs and desires of their users and capitalise on opportunities offered in that environment, they will be able to develop a service programme that meets the expectations of users that is focused on the mission of reference services. In the third unit we discuss the impact of the internet on reference services which resulted in new approaches generally referred to as virtual or digital reference.

Source consulted

Schement, JR. ed. 2002. *Encyclopedia of communication and information*. New York: Gale Group.

CONTENTS

STUDY UNIT 1: Reference service
STUDY UNIT 2: Role of the reference worker
STUDY UNIT 3: Virtual reference services

STUDY UNIT

1

REFERENCE SERVICE



Figure 1.1

User enquiring at the reference desk
(**Source:** Unisa Library)

1.1 INTRODUCTION

In this study unit, we discuss reference services offered by information agencies such as libraries and related information services. The main aim of these services is to connect their users with

the required information. You also learn about the various types of reference services that can be offered and reference services for specific user populations. You will become aware of the current trends in reference services and how they will impact on reference work and the training of reference workers. You are also introduced to electronic reference services specifically to the internet and its impact. Finally, we reflect on the future of reference services.

LEARNING OUTCOMES

After you have worked through this study unit you should:

- understand what reference services entail
- be able to discuss a range of reference process models
- be aware of global trends, including information technology which have an impact on reference services

KEY CONCEPTS

Bibliographic: This is an activity whereby the reference worker checks verification: "verifies" through bibliographic control tools that the information about a document is correct and complete.

Enquirer: A person who makes use of the reference service to satisfy an information need.

Information retrieval tools: Bibliographic sources such as catalogues, indexes, and so forth which refer us to sources containing the required information. These tools are also known as bibliographic control tools.

Information service: An agency the main aim of which is to provide its users with information or sources of information; or access to information to solve information-related problems.

Ready-reference question: A question that requires short factual answers obtained from ready reference information sources containing factual information such as a dictionary or a directory.

Reference service: A component of an information service where personal assistance is offered to users by providing reference sources (printed and electronic) as well as personal advice and guidance by reference workers.

Reference work: Refers to the actual process of assisting users.

Reference worker: A person who provides personal assistance (such as reference transactions and other activities) to users of a reference service.

User group: An identifiable community or part of a community that is being served by a library or information service. Some examples include adults, business people, students, teenagers, children, disabled people and rural women.

1.2 WHAT IS A REFERENCE SERVICE?

Definition

A reference service, also referred to as reference and information services, is that component of an information service where assistance is provided by reference workers to enquirers on a one-to-one basis. Reference sources, search facilities and work stations are provided to enhance the reference activities performed by librarians.

Origin of reference service

Modern concepts of reference activities are usually traced to Samuel Green's 1876 paper entitled, 'Personal relations between librarians and readers'. Green might not have invented the idea of reference service in libraries, but he was the first to describe and publish the concept of assisting library users to use library resources.

Need for assistance

A reference service is required due to several factors such as:

- An increase in the number, variety and complexity of information resources in libraries and other information services.
- An increase in the number and variety of library users with diverse information needs enquiries and literacy skills.
- Users of information are not always familiar with the way in which the variety of retrieval tools function.
- Often, enquirers simply do not have the time to learn the finer and intricate functions of information retrieval tools to access information effectively (Janes 2002).

Guidance and assistance

Over time reference services expanded to include guidance and instruction for users so that they could find their own way among the information sources available in a particular information service; and also learn to use the information retrieval tools without requiring the reference worker's assistance for simple routine operations. Eventually, reference services expanded by also offering access to information beyond the librarian's own library collection.

1.2.1 Varieties of reference services

Emphasis on personalised assistance

The information needs of enquirers largely dictate what type of reference service is offered. The type of service can vary from providing sources containing information or access to information in remote places, to guidance and instruction on how to use the local library, the information retrieval tools and facilities. A variety of reference services have developed over the course of time to provide for the divergent demands of enquirers. All or only some of these types may be offered by one information service. It depends on the nature of the information service and the needs of the user group (Bunge & Bopp 2001). A distinctive feature, however, is that all reference services involve personalised assistance. Remember also that these varieties are not mutually exclusive – they overlap. The different varieties of reference service that a library may provide for its user group(s) include the following:

1.2.1.1 Ready-reference services

Factual information

One of the most basic reference services is the answering of ready-reference questions. A ready-reference question is a type of question that can be answered quickly; and easily by consulting only one or two reference sources such as a dictionary or a telephone directory. It is generally a request for factual information such as an address, the correct spelling of a word, the name of a place, or an event that took place. The tools – both printed and electronic formats – for answering these questions are usually available from the library's own stock and are often close at hand. The reference worker quickly learns how to find information in these reference sources; and handling these questions soon becomes a routine operation.

Link with AIS1503

Since ready-reference questions constitute the major component of reference work, please refer back to what you learnt in detail about the different types of ready-reference sources that provide factual information in Module AIS1503.

1.2.1.2 Bibliographic verification

Bibliographic description

Bibliographic verification is a reference service in which reference staff provides facts about publications. Please refer to the definition of this concept under the key concepts in section 1.1 of the study guide. This type of service is provided when an enquirer wants to confirm; or find out information about a publication or an information source such as a book or article. The type of information to be verified includes the name of an author, title of a document, date of publication, publisher, place of publication, volume, issue numbers and page numbers. These are all elements of a bibliographic description as you learnt in the first-year modules of Information Science. The reference worker has to consult standard bibliographic control tools, such as bibliographies, catalogues, indexing journals and abstracts to provide this type of service.

Link with AIS2601

You learn about these tools in more detail in Module AIS2601.

1.2.1.3 Research questions

Complex enquiries

The provision of research-related assistance requires considerably more time and effort from the reference worker than answering ready-reference questions. This type of enquiry usually comes from managers, students, researchers, academics and postgraduate students. Often the enquiry concerns specific projects on which the enquirer is working. This type of query can be complex, because the enquirer's information need is broader, or the question asked is more complex or less concretely defined. Usually this type of enquiry requires a reference interview and a variety of sources have to be consulted before sufficient information is found.

Serve specialist groups

Not all reference services receive this type of enquiry. The reference services of companies,

research organisations, or academic institutions are most likely to deal with these. However, these types of enquiries may also occur in a public library.

Information services such as museums and archives also deal with a considerable number of research queries. In archives, the reference task is performed by subject specialists such as anthropologists, archaeologists, entomologists and historians. The sources consulted can be slightly different. In museums the sources consulted are museum objects and specimens. The sources consulted in archives are usually archival records that are made available only by appointment to bona fide researchers.

Link with AIS2601

You will learn more about bibliographic tools for museums and archives in Module AIS2601.

Extensive searches

A larger variety of information resources than just conventional reference sources is consulted for research questions. Much use is made of bibliographic sources and full-text databases that could help to access information outside the local library's holdings. Electronic searches are particularly important in handling these queries. The internet also plays an important role in accessing information even faster and in gaining immediate access to the latest results of research conducted elsewhere.

Need for a reference interview

Research questions naturally require more of the reference worker's time and are often dealt with in a separate venue by appointment. In larger libraries or information services research questions are handled by subject librarians. The nature and scope of the research question is such that it requires a reference interview which enables the reference worker to plan and conduct an appropriate search strategy.

The reference interview is further discussed in topic 2 of the study guide.

1.2.1.4 Interlending and document delivery

Interlibrary loan

Interlibrary loan (ILL), also referred to as interlending, interloan, document delivery or document supply is, "the process by which a library requests material from, or supplies material to another library" (Reference and User Services Association 2008). In other words, ILL provides a way for the librarian to obtain, on request of a library user, information resources such as books, journal articles and videos that are not available in the user's local library.

Union catalogue

Some of the enquiries received by a reference service cannot be answered by the holdings of the particular library or information service. In many cases, the enquirer needs to search for the information in a book or source that may not be in the library. In such a case the reference worker can determine, through bibliographic tools (eg printed or online union catalogues) where the required material can be borrowed – usually from another library participating in the interlending system. A library catalogue usually shows the holdings of a single library, but there are catalogues that contain the holdings of a group or consortium of libraries (Chelak 2010). The latter is known as union catalogues. An example is WorldCat, the largest union catalogue with 1.5 billion items (and growing daily), reflecting the holdings of more than 10,000 libraries worldwide.

1.2.1.5 Information and referral services

Information and referral service

A reference service does not always have all the resources that are needed to deal with enquiries. Often the nature of the enquiry is such that the enquirer is best served by an expert or another organisation that is better suited to deal with particular issues, for example a welfare organisation when it comes to welfare or health, or a government department for enquiries about the legislature. In such cases the reference worker will refer the enquirer to the relevant resource outside the library. Under these circumstances, the reference service acts as the facilitator between the enquirer and the information resource that can meet the need. This kind of service is called an information and referral service (I & R).

Information resource file

In order to provide a referral service, the reference service develops its own information resource file containing the names, addresses and telephone numbers of persons or agencies; as well as a list of topics they can deal with. This file – which should always be kept updated – is the most important reference source used for this kind of service. The resource file may be a manual or locally produced database accessed by computer.

1.2.1.6 Current awareness services

Proactive service

Current awareness is a concept that describes the methods used to keep up-to-date with the most recent information in a specific subject or area of interest. A current awareness service differs from other kinds of reference services in that it does not arise from direct enquiries made by users, but is more a proactive service that deals with the information needs of the users' fields of interest. The purpose of such a service is to keep the users aware of the latest developments in their fields as reflected in subject literature. The reference worker, in consultation with the user, draws up an interest profile of the kind of information that the user would like to receive on a regular basis.

Electronic methods

A current awareness service is usually accomplished electronically. The reference worker can access appropriate databases online, conduct a search that matches the profile of the researcher's information need; and request online that the same search be repeated each time the database is updated. The resulting citations can be mailed to the reference worker or directly to the researcher.

Online sources and tools used in virtual current awareness services are discussed in study unit 3.

1.2.1.7 Information brokering

Information brokering is a form of personal assistance run on business principles. This entails provision of a reference service to individuals or organisations in the business sector for a fee. Although it is not a reference service as offered by non-commercial information organisations, it works on the same principles – accessing information on behalf of an enquirer. In information brokering the information broker (acting as a searcher) is not dependent on the resources of a library or an information service.

The service of an information broker is priceless for individuals needing specific hard-to-find information and businesses needing large quantities of information quickly and accurately. The searcher (information broker) may locate information on an occasional basis, or he/she may develop close and lasting business relationships with clients, providing current awareness services, consulting on information needs or programmes, performing ready-reference services, or engaging in a number of related activities.

1.2.1.8 Guidance

The guidance function of reference work involves assisting a user to find information or information materials for an ongoing information need. As with a research question need, the user in this case may be working on a project or planning to change careers or even facing retirement and, therefore, needs information that will help him/her cope. Another example would be a user who is interested in providing home-based care for an HIV/Aids patient and needs to continue learning more about this.

The reference worker's job is, therefore, to advise the user about the relevant information and/or sources that can continually provide the needed information to the user. In other words, the reference worker suggests the best types of sources for the particular information need. In some cases, the reference worker may provide a list of relevant sources. In other cases, the reference worker may develop a pathfinder for the user. A pathfinder is a step-by-step guide to a research area, often pointing out the key sources in that area so that the user can look them up and follow up on any further links. Guidance can be given in the form of readers' advisory services, bibliotherapy, selective dissemination of information (SDI) or term-paper counselling.

Readers' advisory services involve helping the user to develop strategies for finding, evaluating and using information sources for a specified problem or information need.

Bibliotherapy entails the use of literature to help solve people's personal problems.

Term-paper counselling, as the title suggests, is practised in academic and school libraries in America. The reference worker guides student users regarding the library tools and information sources relevant to the specified information need.

1.2.1.9 Instruction

Instruction entails transferring information-seeking skills to users so that they can become independent in finding information by themselves. Instruction has become a major component of reference work, especially with online services where users are taught to use the systems and databases in order to find what they need. The reference worker's job is to assist users in understanding the bibliographic and electronic tools and using them to find and retrieve information relevant to their needs. The instruction can be given on a one-to-one basis, in groups (eg workshops), when a new tool is installed or continually (eg each time there are new students) or at a user's request.

1.2.2 The reference process

The reference process is essentially a process of interpersonal communication with the specific purpose of fulfilling someone else's information need. The reference process entails the whole transaction that takes place between an enquirer and a reference worker. The transactions extend across the two sub-processes of the reference process, namely the reference interview and the search strategy. An interview is necessary to establish what is needed and a search strategy is necessary to try to find the required information. The reference interview is discussed in more detail in study unit 4 while the search strategy is discussed in study unit 5.

Seven models of the reference process will be discussed to help explain how the reference process works. We will start with the Grogan's model, the Eisenberg-Berkowitz model and the reference service model for virtual reference services with regard to the roles people play in the reference process. Then we will end this discussion by looking at Research Commons, the hybrid reference service model and reference services in virtual worlds.

1.2.2.1 Grogan's model

Steps in the reference process

Grogan (1992:51–54) divides the entire reference process into a sequence of eight decision-making steps:

(1) **The problem** – which gave rise to the information need.
(2) **The information need** –Taylor in (Harter 1986:145–146) describes it as a need for information you are consciously aware of (a visceral need), an ill-defined need, a concrete formalised need, or a comprised need that can be presented to an information system.
(3) **The initial question** – the first verbal expression of the information need, which is still ill-defined.
(4) **The negotiated question** – the question that emerges after the initial question has been negotiated.
(5) **The search strategy** – the decision-making step that follows the outcome of the negotiated question. The planning of the search strategy lies in the hands of the reference worker, who is knowledgeable about the various bibliographic control tools and the various reference sources.
(6) **The search procedure** – this step comprises both cognitive and physical action on the part of the reference worker who acts as the searcher.
(7) **The answer** – in other words, information has been found in a reference source or access to the available information has been obtained.
(8) **The response** – includes the communication of the results of the search (answer). If the response is negative for some reason, a post-search interview may be required.

These eight steps form the parameters within which the reference interview and the search strategy take place.

1.2.2.2 Eisenberg-Berkowitz model

Whereas Grogan's view of the reference process focuses on the traditional reference process (seen from a reference service point of view), the Eisenberg-Berkowitz model (Cottrell & Eisenberg

2001) considers the reference process as an information problem-solving process (IPS) in which the encounter with the reference service only forms part of the process. Much more emphasis is put on the reference process as experienced by the user and the role of information literacy in reference work – not only on the reference encounter, but also on the contribution of reference work after the information has been delivered, including application for software, multimedia production and effective writing. The Eisenberg-Berkowitz model of the reference process supplements the model of virtual reference services well.

IPS model for virtual reference services

The information problem-solving model (IPS) includes six stages (see below) which overlap to a large extent with the Grogan model. Each stage has two specific components as indicated below:

Example (1) (finite verbs):

1 Define the task
   1.1 Define the problem
   1.2 Identify the information requirements of the problem

2 Use information-seeking strategies
   2.1 Determine the range of possible sources
   2.2 Evaluate the different possible sources to determine priorities

3 Locate and access
   3.1 Locate sources (intellectually and physically)
   3.2 Find information within sources

4 Use information
   4.1 Engage the information in a source (interpret content)
   4.2 Extract relevant information from source

5 Synthesise
   5.1 Organise information from multiple sources
   5.2 Present information
   5.3 Reference interview

6 Evaluate
   6.1 Judge the product (effectiveness)
   6.2 Judge the information problem-solving process (efficiency)

Combining diffuse services

This model reflects the impact of IT on the reference process and how it causes erosion of the boundaries between different service sections which used to operate separately. This model also relates well to what you have already learned about the typology of information skills in the module on Information Literacy (INS1502).

1.2.2.3 Reference service model for virtual reference services

McClennan and Memmott (2001) have developed a model that describes the various roles played by participants in the virtual reference process and the ways in which those roles interact. The roles

define both the interaction between the various participants and their functions in the operation of a digital service. McClennan and Memmott (2001) identify the following roleplayers who, for the most part, represent the service provision element of the reference process:

(1) **The user:** The fundamental role of the user in the reference process is to ask questions.
(2) **The filterer:** In contrast to the traditional service, the posed question is not received by the person who answers the question. All the questions arrive in the inbox of the service where they are mixed with various kinds of non-questions and need to be sorted. Some of the filtering is done automatically, but there will always be questions that require human judgement. Questions may be categorised in various ways according to subject, user affiliation or estimated degree of difficulty.
(3) **The answerer:** The role of the answerer is the customary role of the reference worker, namely assisting the patrons with their information needs. This is probably the most time-consuming job in virtual reference, forming the core of reference work.
(4) **The administrator:** The role of the administrator is to smooth the flow of the work. The tasks performed by the administrator clear the way for the answerers and filterers to do their jobs properly. Administrators are the watchful eyes that keep the service consistent and running smoothly on a daily basis.
(5) **The coordinator:** The coordinator is responsible for defining and implementing the policies and procedures of the reference service. The responsibilities may include selecting software, setting clear and well-understood policies and procedures, getting feedback from the rest of the staff and making personnel decisions.

1.2.2.4 Research Commons: an integrated service model

The Research Commons, also referred to as the Student Research Centre or Information Commons, is, "a student learning-focused research space with multiple computer stations presided over by a librarian" (Deineh, Middlemas & Morrison 2011).

Rumble (2011) notes that Research Commons are designed to enhance the role of libraries as multifunctional communal learning spaces. In academic libraries the Research Commons are used by postgraduate students, researchers and academic and the following facilities are available to them:

- state of the art technology including wireless network, access to software such as Microsoft Office applications, as well as reference management software such as RefWorks, and hardware facilities such as laptops, laser printing, digital projector and screen, scanner, and photocopier
- study tables and seminar rooms
- relaxed seating

1.2.2.5 The hybrid reference service model

Hybrid libraries evolved in the 1990s when librarians started using not only printed material such as books and journals to help library users find information, but also electronic information resources. Today the hybrid library has (i) non digital resources (eg books in printed format), (ii) resources which have been digitised or are in the process of being digitised, (iii) resources that are only in digital format or in digital and printed format, and (iv) new technology for storing information. For some libraries the hybrid model is a transitional state while moving over to a virtual library,

but for other libraries it is the preferred model because of their user profile (ie some of their users do not have access to the internet and the latest technology, while others have access to both).

Every hybrid library needs to solve the staffing and physical space arrangement with regard to reference services in such a way that library users are served optimally and user satisfaction is guaranteed.

1.2.2.6 Reference services in virtual worlds

Mark Bell (2008) defined the concept "virtual world" as: "a synchronous, persistent network of people, represented as avatars, facilitated by networked computers."

Synchronous: The first characteristic describing this virtual world is the term "synchronous" and it means existing or occurring at the same time (or in real time).

Persistent: The word persistent means that the virtual world continues to exist and functions whether or not you are there.

Network of people: The concept "network of people" means that people who are visiting the virtual world communicate and interact with one another and the environment.

Avatar: An avatar is a graphical representation (graphical or textual) of a person in the virtual world that has agency (an ability to perform actions) and is controlled by a person in real time.

An example of a virtual world is Second Life (SL). For more information on SL, go to: http://secondlife.com/. SL is a 3D world where everyone you see is a real person and every place you visit is built by people just like you.

If you want to see how a paper is presented in Second Life, watch the following YouTube video showing Henry Lowood, a Stanford University Libraries researcher, using his avatar to present a session on preserving virtual worlds:

http://www.youtube.com/watch?v=Ln0j2CPXfqc (minutes: 21:12).

Reference services

Virtual libraries in SL are mostly found in Cybrary City on Information Island (called Info Island). Reference services on Info Island are structured in a traditional way with a reference desk staffed by volunteer librarians. Every reference librarian works a two-hour shift and, "attends regular reference staff meetings where technical and avatar-to-avatar reference interview training is offered" (Hudson 2011). Reference librarians have the following responsibilities: (i) to provide tours of the Second Life library, (ii) to offer instructional sessions, and (iii) to attend conferences. Reference avatars communicate via text and voice-enabled technology. To be a reference avatar, one needs to be multi-model literate.

1.2.2.7 The embedded librarianship model

Jake Carlson and Ruth Kneale (2011) describe embedded librarianship as follows:

Embedded librarianship takes a librarian out of the context of the traditional library and places him or her in an 'on-site' setting or situation that enables close coordination and collaboration with researchers or teaching faculty. The idea behind the embedded librarianship model is to enable

librarians to demonstrate their expertise as information specialists and to apply this expertise in ways that will have a direct and deep impact on the research, teaching or other work being done. Through embedded librarianship, librarians move from a supporting role into partnerships with their clientele, enabling librarians to develop stronger connections and relationships with those they serve.

Embedded librarians are usually found in an academic environment. To be more specific, an embedded librarian is a librarian who is not working in the traditional setting of the academic (college or university) library, but is placed in an academic department to assist academic staff in their teaching, research and community-related duties or in an online class for a period of time to support the students in their research process.

The embedded librarians as part of an online class at the Prince George's Community College (PGCC):

- provide information about the library's databases, e-books and services
- help students find credible web sources
- assist with citations
- help narrow topics and brainstorm ideas for research
- identify keywords and search terms for a topic
- assist students with the PGCC online catalogue
- answer questions about the library or research

To read more about this topic, go to:

http://pgcc.libguides.com/content.php?pid=346846&sid=2844744

David Shumaker (2013) remarks that in this scenario, "instead of the reference desk serving as the intake point for tasks referred to the embedded librarian, the embedded librarian serves as the information project coordinator, relying on reference desk and other centralised library staff for backup and support (like document delivery) when executing complex research or information management projects."

Now, let's look at global trends that have an impact on reference services.

1.3 GLOBAL TRENDS THAT HAVE AN IMPACT ON REFERENCE SERVICES

Paradigm shift

The landscape in which libraries operate has changed dramatically in the past decades (ACRL Research Planning and Review Committee 2010) and also impacted on the delivery of reference services. This is as a result of social, economic and technological changes that have taken place in society as a whole; which are mirrored in information agencies. All these have had some kind of impact on reference services which have been forced to adopt new approaches in serving their users. The following are some of the general trends that have contributed to a paradigm shift in reference work (ie a moving away from traditional practices).

1.3.1 Economic trends

Financial constraints

Economically the global recession and collapse of financial markets have placed many countries

in a position where they had to re-evaluate and reprioritise government spending. Libraries are dealing with major budget cutbacks and many public and school libraries even face closure.

Resource sharing

All these factors have initiated a new paradigm of access (resource sharing); which is to move away from self-contained collections to an emphasis on linking to national and regional bibliographic networks such as SABINET online and other consortia we find in South Africa to enhance local resources. (You learn more about resource sharing, networks and consortia in AIS2601.)

1.3.2 Social trends

Emergence of new user groups

Demographic patterns show that migration has resulted in an influx of newcomers to the reference service environment. These newcomers have different backgrounds, lifestyles and needs to those of the traditional users. Language, level of literacy and need for information on health and welfare and coping with life in a new environment are all issues that have brought about changes in the types of reference services (Dawson & De la Pena McCook 1996:65).

The emergence of new user groups has resulted in a demand for more guidance and instruction in the use of facilities and tools to access information.

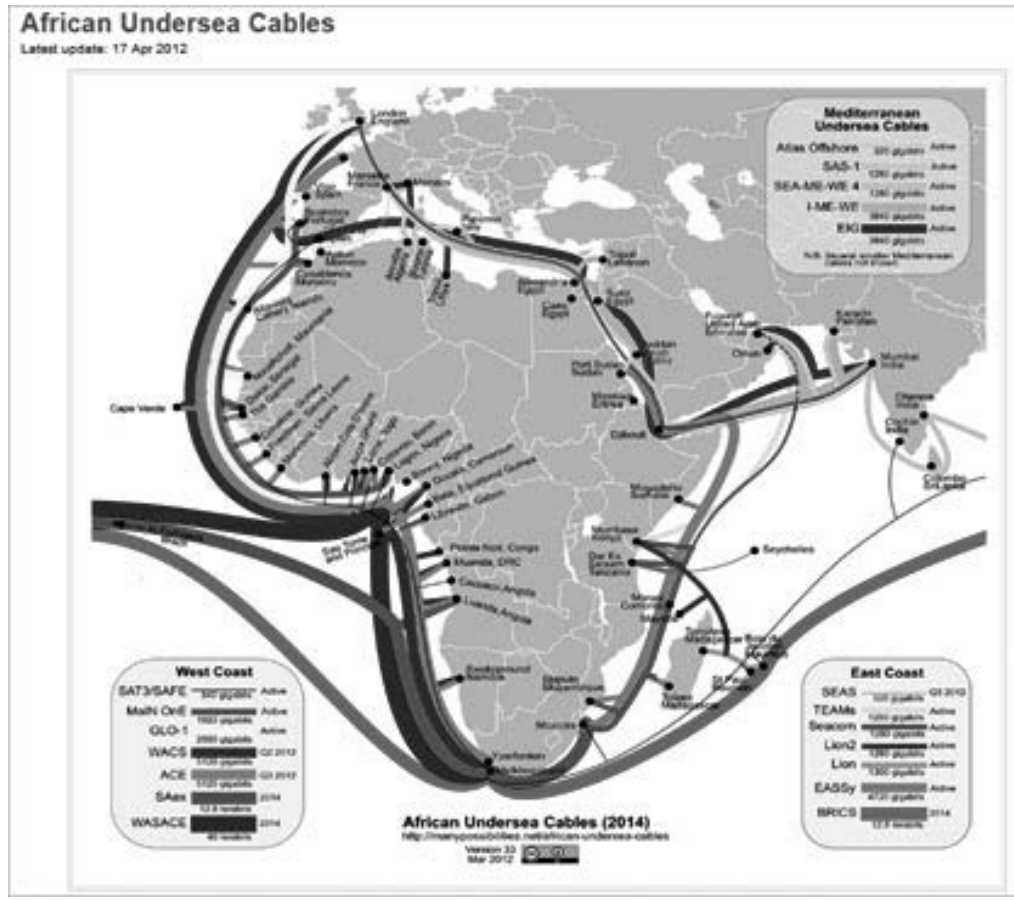
1.3.3 Technology trends

Digital revolution

The World Wide Web is twenty years old and today the internet provides a 24/7 accessible infrastructure and people expect to be able to work, learn, and study whenever and wherever they want to.

Broadband internet capability in Africa

Internet access in Africa is a challenge but undersea cables will make access much easier as they improve bandwidth connectivity in Africa (see figure below). It will also help reduce the cost of telecommunications in African countries.



Social media

Social media use (eg Facebook, Twitter, LinkedIn, blogs, YouTube, podcasts, wikis, etc) soared globally by 20% in 2012 and is set to continue its rapid growth in 2013, according to E-marketer (Arno 2013). Did you know, an amazing 48 hours of video are uploaded every minute on YouTube resulting in nearly eight years of content uploaded every day.

E-books

Although e-readers and e-books have been around for over ten years, new devices made it much easier to access e-books. The e-book revolution impacts not only on the creation of books, but also on the distribution chain from author to bookseller.

Mobile phones

There is an enormous growth in mobile technology and today 70% of the world's population has a mobile phone. In Africa there is an exponential increase in mobile web access, especially for using social media such as Facebook, e-mail, Short Messaging Service (SMS) and Instant Messaging (IM) use. Mobile phones have become deeply embedded in business, social activities and learning (Hahn 2012).

OsibeImhoitsike, market coordinator for Sub-Saharan Africa at the Norwegian firm Opera, states that the "mobile is fast becoming the PC of Africa" (Ogunlesi & Busari 2012).

QR codes

An emerging mobile technology that must be mentioned here is QR (Quick Response) codes and location-aware or location-based services. It can embed much more data than a barcode (Walsh 2012). To get a QR reader for your mobile phone, you can go to the website Mobile-Barcodes.com which has a list of popular QR code readers. An example of how QR codes are used in a library:

This is an example of a QR code.

Library users of the Mudd Library of the Lawrence University in Appleton Wisconsin (USA) can check the status of their interlibrary loan requests by scanning the QR code on the left.

Augmented reality

Augmented reality (AR) is, "a live, direct or indirect view of a physical, real-world environment whose elements are augmented by computer-generated sensory input such as sound, video, graphics or GPS data" (Wikipedia). See the photo below which shows the Wikitude World browser on the iPhone 3GS using GPS and a solid state compass.



Wikitude (http://en.wikipedia.org/wiki/File:Wikitude.jpg)

For example, by using a mobile phone with the help of advanced AR technology, you can look at a specific area through the camera and see it while more information about the area is provided by written text displayed over the image on the screen.

1.4 IMPACT OF TECHNOLOGY ON REFERENCE SERVICES

Advances in information and communication technologies (ICT) have changed the face of traditional reference services (Cassell & Hiremath 2006; Forsman 2012; Hammond 2012). Some of the changes have already been touched, but let's summarise the impact in more detail.

1.4.1 Type of personal assistance

Automatic tools

An outstanding feature of traditional reference work is the in-person assistance offered to users to locate and deliver information from sources available in a library's own collection, or through interlibrary loans from holdings of participating libraries. Automatic tools and access to remote sources have steadily reduced the need for personal assistance that requires skills for complex searches in printed collections and on online databases.

Drop-down menus
Template
Electronic reference services

ICT literate users can follow drop-down menus, click on icons or headings and use search engines which end users can easily use by themselves. As a result, statistics on reference desk services show a decrease in demand as more users move to digital services for ready-reference (simple) questions. Search engines provide a question-response template with alternatives on which the user should click. The answer-processing engine retrieves the answer template that contains the links to answer locations. The user can, therefore, select a query from a predefined set of queries on a given topic which appears on the computer screen. In this type of service, the intermediation of a reference librarian is no longer required. As a result, many reference librarians have now turned their attention to the provision of electronic reference services which still has a personal touch, but in another context.

End-user instruction

Thus, in-person assistance is still required, but in a different form. Technological advances have resulted in providing information in different formats and new resources which require different techniques; and skills for accessing information have been developed. This has resulted in a higher demand for end-user instruction in the absence of human intermediaries. User training and assistance in online searching have now become the types of personal assistance required from the reference librarian. Thus, more and more emphasis is placed on technical support as a form of reference assistance.

Information literacy

ICTs have enabled more users to use reference services. However, these users are often ignorant of effective, time-saving search techniques and do not always know how to distinguish between relevant and poor or untested information. As a result, reference librarians spend more time on instruction on how to use technology correctly and how to search for and evaluate the required information. In essence this amounts to teaching users information literacy.

1.4.2 Types of services

Virtual reference services: web reference
FAQs
Roving reference
E-mail services

The internet provides much more information than is available in individual library collections or consortia. Many non-library organisations now offer web-based information services which do not require a visit to the library to get answers to information queries.

Are reference services, therefore, no longer required? Many reference services have now turned their attention to providing electronic or virtual reference services. This means that the parameters of reference services offered to users are shifting. Apart from face-to-face reference, new services include web references, frequently asked questions (FAQs), e-mail services where reference questions are answered in off-time, roving reference where assistance is offered at the point of need (eg at the computer terminal or the journal section), chat services and call centre reference where enquiries are forwarded to libraries belonging to a consortium which may have the expertise to assist the enquirer.

Interactive real-time service

The majority of real-time virtual reference services such as chat reference and human assistance are essential to guide and advise users as the search advances to ensure feedback. Thus, the librarian's intangible qualities (ie knowledge of and skills in handling reference sources and tools) become vital when providing reference services in a digital environment. In effect, what happens is that reference services now use virtual reference services and even virtual worlds as facilities to extend their services beyond the library walls.

1.4.3 Interaction with users

Downscaling of manual reference

Technological changes have altered the relationship between the users and the reference services. As internet facilities become easier to use, more and more users are moving to web-based (digital) reference services for ready-reference (simple) questions. Users no longer ask for ready-reference assistance. They Google it!

Menu-driven instructions
Development of templates

The traditional pathways to finding answers (search strategy) have changed course. The menu-driven instructions of online searches are easy for lay people to follow. Since web-based services have been built on answering factual questions, the reference interview required for conducting manual searches has been marginalised. Closest to the traditional reference interview is the development of templates on which the user provides details in the identified slots and predetermined answers built on experience with frequently asked questions (FAQs) are provided.

Increase in e-mail reference

The internet has transformed the traditional form of interaction in reference services and changed the ways reference workers communicate with users. It enables remote users to make use of reference services through e-mail; and librarians can extend their reach to anywhere in the world. E-mail enables reference transactions to take place outside the library walls. In-person contact at the reference desk is decreasing. However, in-person contact is used more and more for directional instructions and user education in electronic applications.

Seamless access
End-user responsibility
Information mining
Increased need for evaluation

Traditional online searching has also become marginalised. The use of internet online searching

offers more interfaces and opportunities for seamless access. Control of searching becomes an end-user responsibility. However, web-based services only search the internet and not the vast collections of libraries through their online catalogues. Reference librarians' knowledge of the information sources and resources and their experience in providing information provides an opportunity for information mining. Reference librarians are needed more than ever to sift, sort and select information for specific purposes.

1.4.4 Resources

Advances in ICT have vastly improved the access and delivery of information for reference purposes. In the past information was delivered via a library's own collection or interlibrary loans. Now document delivery is possible through all sorts of electronic media, for example software (eg Adobe Acrobat), e-mail, list serves, web links or interactive databases.

Ease of access
Access to a large variety of information sources

The internet provides easy access to many more information resources than are available in individual libraries or consortia. The array of available information is astounding and the cost savings and ease of access to internet resources are major advantages.

1.4.5 Reference librarians

Impact of technology
requires informal training of users

Technology has changed the reference librarian's role substantially. The advent of digital services has resulted in greater demand for end-user instruction and assistance in online searching. The changed reference populations require librarians to introduce them to basic computer skills, such as typing, using the mouse, saving, printing, using e-mail, negotiating multiple windows and so forth. Since factual enquiries can be handled by users themselves, reference librarians must acquire new skills to conduct complex information searches such as the utilisation of specialised syntax; basic understanding of how a computer search engine works; the mastering of key concepts (Boolean operator, relevancy searching); scanning full text for content; matching key words and so forth.

Reference staff also need somewhat different skills to communicate with users via e-mail through pushing web pages, escorting and co-browsing in chat reference and call centre services (eg "click here to accept the request for chat" or "click there to enter the URL"); or using predetermined messages to let users know they are still connected and the librarian is working on the question. In order to master these skills, reference workers need to be more knowledgeable about the appropriate software for communicating with users in real time.

Technology has impacted on the provision of user education. Reference work has become multifaceted and reference workers must understand the new electronic resources to know how to provide seamless interpretation of an information overload. There is an increased need for staff training for lifelong learning to tackle the challenges of continuously changing technology.

1.4.6 Trends in reference work

It is evident from the information above that current trends in society as a whole have implications for the provision of reference services.

First of all, reference services will have to accommodate various types of users ranging from new literates to research and development scholars.

Economic factors mean a shift from the use of local collections to shared access of remote collections (resource sharing) as allocated budgets decrease.

Technological changes have opened up new avenues such as faster access to a larger number of sources. A convergence of telecommunication technology and computers has caused a paradigm shift affecting the manner in which we access, manipulate and interpret data (Silva & Cartwright 1994).

In the current situation, reference services will be a mix of information provided from own collections and electronic access to materials in remote places. Providing access and coping with technology has become a principal goal and activity of reference services.

Printed material will not disappear and ways of integrating (hybrid) services based on the two media (ie printed and electronic) need to be developed. This will require innovation.

Reference workers need to foster the joy of reading and supporting the development of literacy in all its forms. They also play an important role in enabling independent lifelong learning, research and innovation.

1.4.7 Changes in reference services

We live in a world where swift ongoing technology change is the norm and fast changing technology is also the number one force that has an impact on reference services today (Bopp & Smith 2011; Berndtson 2012).

Radford (2012) predicts the following changes with regard to reference services:

- Drastic changes in every aspect of reference services lay ahead.
- The adoption of Web 3.0 technologies is taking place.
- Reference work will be closely linked to mobile technology.
- More collaboration and cooperation between all types of libraries will develop.
- Creative staffing solutions will be needed due to the faltering economy.
- Reference librarians will be involved in creative technology innovations.
- They will also be more involved in social media which will allow them to engage in increased reference consultation with one another in a way that will be seamless to their users.

The future holds exciting and creative opportunities for reference workers who are willing to learn and adapt to changing circumstances.

1.5 ASSISTANCE TO SPECIFIC USER GROUPS

Different information services cater for different types of clientele whose needs vary according to their occupations or interests. Socio-political, economic or technological factors may, to a

certain extent, determine how the profile of these user groups changes over time. For example, more and more schoolchildren may make use of the reference services of their local community libraries to complete school tasks since the local library is located more conveniently or is better stocked than their local school media centre.

Apart from the conventional users for whom reference services have traditionally catered, the following groups, who require additional assistance or even a change in approach, may present themselves.

1.5.1 Modern pluralistic society

New audiences

With the changes in the demography of society, more and more users who did not make use of reference services in the past are now making use of them. This changing population includes those who do not have English as a first language, those who come from different backgrounds, those with different levels of literacy and of course those with different levels of information literacy (Dawson & De la Pena McCook 1996:65). Most of them need personal assistance in the form of instruction to orient them and find their way in the physical setup of the reference service.

With the emergence of the internet, another user group, consisting of users who were not necessarily traditional users of reference services, has emerged. The new internet/intranet users have good computer skills, but have little knowledge of querying language and protocols. They also have limited experience in recognising the quality and value of information products in a situation where formal and informal publishing coexist.

1.5.2 Disabled individuals

Visually impaired

Within this category we can identify two subgroups, that is, visually and hearing-impaired persons. Where possible, especially in public libraries, reference services should provide special collections for these users. As far as visually-impaired persons are concerned, public libraries strive to provide large-print reference books and, if available, books printed in Braille.

Hearing impaired

Hearing-impaired persons have traditionally been less well served. Several steps can be taken to serve users with hearing impairments. Probably the most practical would be to publicise reference services through brochures and other means to the hearing-impaired community. Where possible, setting up e-mail systems and bulletin boards that are accessible to hearing-impaired persons can also improve reference services to these groups.

1.5.3 Specific age groups

Children and young adults

Apart from the general adult group making use of reference services, we identify two more age

groups, namely children and young adults. Both these groups approach reference services with school-related queries. It is important to provide information that is stated simply to young children. Reference workers should have reference sources that are easily readable for this group to consult.

1.5.4 Remote users

Internet users

Due to new technology, remote users are becoming more and more a feature of reference work. Although this type of user is not present when enquiries are made, they still need personal assistance. Many reference services offer an e-mail service to their users. Their websites offer the searcher the opportunity to ask questions via e-mail.

1.6 CONCLUSION

In this study unit we have introduced you to the nature and purpose of reference services. You have learned about the variety of reference services available today. You have also learned how these services have adapted to new trends caused by socioeconomic and technological changes in the information environment. In the next study unit, you will be introduced to the role of the reference worker.

1.7 REFLECTION EXERCISES

EXERCISE 1

Write down in your own words what you think a reference service entails.

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EXERCISE 2

Motivate the need for a hybrid reference service model in South Africa.

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EXERCISE 3

Why do you think it is necessary for a reference worker to know about the latest information technology developments? Provide examples.

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1.8 SOURCES CONSULTED

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1.9 ANSWERS TO EXERCISES

EXERCISE 2

For some libraries the hybrid model is a transitional state while moving over to a total virtual library, but for other libraries it is the preferred model because of their user profile (ie some of their users do not have access to the internet and the latest technology while others have access to both).

EXERCISE 3

Reasons can include some of the following:

(1) To provide better reference services.
(2) To be able to provide information via different modes of delivery, for example, e-mail, chat, Facebook, and so forth.
(3) To serve those library users who are digitally literate and prefer to use the latest information technology.

STUDY UNIT

2

ROLE OF THE REFERENCE WORKER



Figure 2.1

Reference worker helping a library user
(**Source:** Unisa Library)

2.1 INTRODUCTION

In this study unit, you will become aware of the important role a reference worker has to play in linking users of a reference service with the right information to complete a particular task successfully. You will learn about the meaning of professionalism and why it is important for reference workers to interact with users in a professional way. You will also learn about the responsibilities of reference workers and the competencies they require to assist users effectively. You will look at the reason why reference workers need continuing education and training to remain relevant in their assistance to users. Finally we will reflect on the future of reference workers.

LEARNING OUTCOMES

After you have worked through this study unit you should

- understand what personal assistance entails
- know what professionalism in reference work entails and be familiar with the six aspects listed in the IFLA Code of Ethics for Librarians and other Information Workers
- know what the responsibilities of a reference worker are
- be able to argue why continuing education and training of reference workers remain necessary

KEY CONCEPTS

Competencies: Behaviours that excellent performers exhibit more consistently and effectively than average performers.

Guidance: Personal assistance in choosing appropriate information or information sources. Guidance can also be offered in the choice of electronic information resources, for example databases and search engines.

Interpersonal skills: Interpersonal skills have to do with behavioural characteristics that come into play when the reference worker offers personal assistance to users of the service.

Instruction: In the reference context, instruction refers to the personal assistance offered to users to access information through using information and communication technologies, for example online searching of catalogues, databases indexes or other internet resources.

Personal assistance: Assistance offered on a one-on-one basis by the reference worker to users of the reference service.

Work station: Usually a number of computer terminals in the reference area where users can do their own searching.

2.2 PERSONAL ASSISTANCE

The following example of personal assistance is used to set the scene for this study unit. The factual content of the unit will be worked around this background; always coming back to the real-life reference scenario.

2.2.1 Reference scenario

Nomtansi and Peter are two first-year students who enter the reference section of the university library. They are friends who met each other for the first time when they came to register for their respective courses in Engineering and Economics. Although they are not completely unfamiliar with the services offered by libraries, this is their first encounter with a really big university library with a separate reference section and its own staff ready to assist all people who make use of their service. These users include all students registered at the university, all the lecturers, researchers and other people working there.

When the two friends enter the reference section, they see, on their left, a number of reference workers at a counter with several computer terminals and telephones at their disposal. One reference worker is attending to a student who is asking about an article he needs for his next assignment. Another reference worker is simultaneously assisting a lecturer who is enquiring about material for his research project and making a telephone enquiry with the processing department about a book that has been ordered for the lecturer at the reference counter. A little further down, another student is asking a reference worker to show her how to use the computer work station to find information for an assignment she is working on. The reference worker takes her to the work station area where quite a number of users are working at computer terminals. They notice that there is another reference worker in conversation with a user sitting in front of a terminal, explaining to the user how to use the electronic catalogue. Although there are a lot of people coming and going, the reference section is fairly quiet. Everybody goes quietly about their tasks and the reference workers make a good impression. They really look friendly and willing to help the users with their queries.

When it is Nomtansi and Peter's turn, they explain that they have registered for first-level courses and although they attended the library's introductory programme, they are feeling a bit overwhelmed and they are not sure how to start on their own. The librarian listens sympathetically to them. She knows only too well how daunting a new library environment can be with so many people around, who seem to know exactly how to find their way and go about their tasks. She asks them a few questions to find out what exactly they are looking for: Do they need to find a specific book or article for an assignment, or do they need her to show them how to make use of the library's catalogue or how to get access to subject databases where they can do their own search for information on their respective topics?

2.2.2 Defining the reference worker

Reference work, where personal assistance is given to users of an information service, had its origins in the second half of the 19th century. This was an era when education of the general public was on the rise. More and more people went to their local public libraries to gain access to the local collections. Since then the primary goal of the reference service has been to link users to the information for which they are looking. Later this function became more sophisticated when reference workers found that it was necessary to conduct a structured interview to help users define their information need more clearly. Therefore, reference interviews came into being whereby the reference worker offered one-on-one assistance to the enquirer. For effective interviewing the reference worker needed counselling skills to establish what exactly the enquirer wanted and also to plan an effective search strategy.

The rapid growth and availability of information in electronic form forced yet another responsibility onto the reference worker: that of accessing information in sources outside the local collection. ICT has created a whole new range of options for finding and delivering information needed by users. All this brought about a change in the personal assistance to be offered to the users of a reference service. As information increased rapidly and search facilities became more user friendly, a need emerged among the users (known in this context as end users) to search for information by themselves. So, the personal assistance required from the reference workers became focused on instruction – teaching users how to conduct an online search, and how to follow menu-driven instructions of the different search programmes to access information in remote locations via the internet.

Depending on what is required in a specific reference service, personal assistance may vary from interviewing and searching for information in books, guiding users in the use of catalogues, bibliographies and indexing journals to instruction and facilitation in using electronic search tools or sophisticated search methods. However, it seems that the majority of personal assistance offered currently is more at the level of instruction at the work stations.

The discussion so far has helped us to develop the following definition of a reference worker: A reference worker is a person who provides personal assistance to the users of a reference service. Personal assistance may be in the form of providing information obtained from sources in the local collection; access to information in remote collections; guidance in selecting the different bibliographic control and other search tools available for accessing information and instruction in using these tools.

2.3 IMPORTANCE OF THE REFERENCE WORKER

The quality of a reference service is based largely on the competence of the reference personnel. It is often said that reference services are only as good as their front line. This is because the reference workers are often an enquirer's first encounter with the reference service. Therefore, one can expect that the users' first impression of the reference personnel will shape their lasting impression of the reference service as a whole.

As a result of a mix of hard copy, microforms and electronic forms, reference work has become complex and enquirers need help to access information. In most instances the search tools and search processes for electronic sources (eg database selection, search formulation and execution of searches) are too difficult for the layperson. The proliferation of information and its various forms require search skills and processing abilities beyond that of the average user.

An enquirer wishing to obtain information is often not aware of the efforts involved in accessing the right information effectively. Most enquirers do not have enough time to launch their own search – which will tend to be unstructured in many instances. In this regard, reference workers who know how to access the specific facts needed at a given time become vital to the information community and are increasingly recognised by users as experts.

We argued earlier that the quality of a reference service is based largely on the competence of the reference workers. It is also true that users trust reference personnel who are not only competent, but interact with them in a professional way. So, let's have a look at what professionalism means, and how it comes about in personal assistance.

2.4 PROFESSIONALISM

Professionalism has an important role to play when it comes to the credibility and the quality of service offered by libraries and information services. After you have worked through this section you will realise why reference workers should act professionally in their interaction with users seeking authoritative advice.

Broadly speaking, professionalism refers to the way in which a particular occupation is practised. The following are among the basic requirements that have to be met by practitioners of a professional occupation:

- They must have a solid theoretical foundation in the subject area of the occupation.
- They must have specific skills required to carry out occupation-related tasks effectively.
- They must be able to provide a service of outstanding quality that meets the set standards and norms.
- They must have the necessary status.

Professionals win the recognition and respect of the community in which they operate by proving that they can provide a service that reflects the necessary knowledge and skills. In this way they prove that they are specialists in their field. They must also prove that they are abreast of the latest developments in their field and are always prepared to adapt to changing circumstances. Professionals are responsible to themselves and their profession to constantly improve their personal knowledge, skills and attitudes, all of which determine their behaviour.

Professionals must display a positive attitude towards their occupation and community in order to be assured of the continued support of the community in which they operate. Loyalty towards the profession and clients are critical here.

Now let's consider the degree to which the reference worker needs to act professionally.

2.5 THE REFERENCE WORKER AS A PROFESSIONAL

In the information profession reference workers probably have more direct contact with their users than anybody else in an information service. Thus, the users of the service view the reference workers as their window on the profession. It is crucial, therefore, that the reference worker projects a professional image in the execution of his/her task.

In order to display the qualities required of an information professional, the reference worker should possess the following attributes: (i) a wide knowledge base, (ii) appropriate behaviour, and (iii) conduct in line with the IFLA Code of Ethics for Librarians and other Information Workers (2012) [full version] | [short version].

2.5.1 Wide knowledge base

A professionally trained reference worker should have a solid theoretical foundation in information science and all the processes and techniques to access and transfer information. In addition, he/she should also have a broad general knowledge of what is going on in the world to be able to handle a wide range of enquiries with ease and expertise.

According to the RUSA (reference and user services association) guidelines for Professional Competencies for reference and User Services Librarians (2003), there are seven areas of knowledge essential for reference and user services librarians, namely:

(i) the structure of information resources in areas of knowledge central to primary users
(ii) knowledge of basic information tools, including online catalogues, search systems, databases, websites, journals and monographs in both printed and electronic formats, videos and sound recordings
(iii) information seeking patterns and behaviours of primary users
(iv) communication principles involving interaction with users both in person and through other channels
(v) the influence of technology on the structure of information
(vi) copyright and intellectual property law
(vii) information competency standards

These areas of knowledge will further be discussed under 2.6.2.

2.5.2 Appropriate behaviour

Interest and enthusiasm: Professional reference workers must be enthusiastic about the profession and should be alert and interested in what is going on around them. They should always be ready to learn something new and be willing to improve their understanding of a topic in the interests of their clients. In this way reference workers project a positive image of the profession which inspires confidence.

Honesty and credibility: It is important that the reference worker is aware of the limits of his/her knowledge and abilities. A reference worker, who cannot assist an enquirer at a specific point, should be honest enough to admit it openly and call on a colleague's assistance. This will leave an impression of credibility rather than mistrust on the enquirer's part.

Dignity: A reference worker should under all circumstances try to remain dignified, even under the greatest pressure; to the user of the service, this creates an impression of efficiency and a feeling that the reference worker can handle any challenge.

Efficiency: As far as personal appearance and surroundings are concerned, the reference worker should try to be as orderly as possible so that activities can be performed efficiently and unforeseen situations can be handled more easily. This will earn respect from the users.

Consideration: The reference worker's occupation entails regular contact with the users of the reference service. It is, therefore, important that the reference worker should display a positive attitude by being considerate and courteous – showing that he/she cares. There should be a relationship of trust between the two parties. Users must be sure that their privacy will be respected during a reference encounter and that an enquiry of a sensitive nature will not be discussed in the presence of others.

Approachability: A library user must feel comfortable to approach the reference worker. A smile and a friendly greeting as well as offering assistance can all play a role to be perceived as approachable.

Please read RUSA's Guidelines for Behavioural Performance of Reference and Information Service Providers (2004).

Although we may not possess all the qualities above, we should at least strive to practise them in our profession. The manner in which reference workers practise their profession will determine the extent to which they promote an image of professionalism. If professional reference workers are disorganised or disinterested, their negative attitudes will be unconsciously transmitted to colleagues to the detriment of the reference service as a whole.

2.5.3 IFLA Code of Ethics for Librarians and other Information Workers

[IFLA is the abbreviation for the International Federation of Library Associations and Institutions.] These are the six aspects listed in the *IFLA Code of Ethics for Librarians and other Information Workers* (short version) quoted verbatim:

1. Access to information

The core mission of librarians and other information workers is to ensure access to information for all for personal development, education, cultural enrichment, leisure, economic activity and informed participation in and enhancement of democracy.

To this end, librarians and other information workers reject censorship in all its forms, support provision of services free of cost to the user, promote collections and services to potential users, and seek the highest standards of accessibility to both physical and virtual services.

2. Responsibilities towards individuals and society

In order to promote inclusion and eradicate discrimination, librarians and other information workers ensure that the right of accessing information is not denied and that equitable services are provided for everyone whatever their age, citizenship, political belief, physical or mental ability, gender identity, heritage, education, income, immigration and asylum-seeking status, marital status, origin, race, religion or sexual orientation.

To enhance access for all, librarians and other information workers support people in their information searching, assist them to develop their reading skills and information literacy, and encourage them in the ethical use of information (with particular attention to the welfare of young people).

3. Privacy, secrecy and transparency

Librarians and other information workers respect personal privacy, and the protection of personal data, necessarily shared between individuals and institutions. At the same time they support the fullest possible transparency for information relating to public bodies, private sector companies and all other institutions whose activities affect the lives of individuals and society as a whole.

4. Open access and intellectual property

Librarians and other information workers' interest is to provide the best possible access for library users to information and ideas in any media or format, whilst recognizing that they are partners of authors, publishers and other creators of copyright protected works. Librarians and other information workers seek to ensure that both users' rights and creators' rights are respected. They promote the principles of open access, open source, and open licenses. They seek appropriate and necessary limitations and exceptions for libraries and, in particular, seek to limit the expansion of copyright terms.

5. Neutrality, personal integrity and professional skills
Librarians and other information workers are strictly committed to neutrality and an unbiased stance regarding collection, access and service. They seek to acquire balanced collections; apply fair service policies, avoid allowing personal convictions to hinder the carrying out of their professional duties, combat corruption and seek the highest standards of professional excellence.

6. Colleague and employer/employee relationship
Librarians and other information workers treat each other with fairness and respect. To this end they oppose discrimination in any aspect of employment because of age, citizenship, political belief, physical or mental ability, gender, marital status, origin, race, religion or sexual orientation. They support equal payment for equal work between men and women, share their professional experience, and contribute towards the work of their professional associations.

From the above you become aware that the qualities needed to meet the demands of professionalism require of reference workers to be competent in many ways. We will deal with these competencies in the next section as the different kinds of skills required of reference.

2.6 COMPETENCIES

As previously indicated, the quality of any reference service depends largely on the competencies of the reference staff. In an information service the reference workers probably have more direct contact with the user community than any other employees. The reference workers are often the user's window on the quality of service offered by libraries and information services. It is, thus, of vital importance that the reference workers understand the group of users they are to serve, and have the right attitude towards interacting with them. They should also be familiar with their institution's policies and they should know their reference sources, facilities and processes that should be followed to gain access to information quickly and effectively.

The competence of reference workers depends on a theoretical knowledge base and a number of skills we can divide into three categories, namely interpersonal skills, intellectual (or cognitive) skills; and technical skills as discussed below.

2.6.1 Interpersonal skills

Since reference workers are in the front line where they make direct contact with the user public, interpersonal skills are crucial. Outstanding service is not so much a skill to be learned than an attitude – an attitude of concern for people, a desire to assist them to the best of our abilities. We may be experts in organising and delivering information, but if we lack the necessary customer service and human relations skills, we have only done half the job. We, as reference workers, must have a passion for serving people to rise above mediocrity.

Some of the essential interpersonal skills for reference workers are discussed below:

Attitude: The manner in which the reference worker responds to the user is as important as the answer to the reference question. Attitude is closely linked to approachability. For example, when enquirers approach a reference worker they expect assistance in locating information. A pleasant demeanour during this encounter will leave a lasting impression on the enquirer. The manner in which the reference worker responds to an enquiry is important.

Enquirers may be reluctant to ask what they really want to know. Their behaviour may range from enthusiasm to reluctance, shyness or feelings of inadequacy. How we as reference workers present ourselves to enquirers can make all the difference. Through positive body language, eye contact or welcoming gestures such as a smile or other verbal and nonverbal cues, we can show empathy and respect to the enquirer. In other words, we can create an atmosphere in which the enquirer feels comfortable.

We must be sincere in our response to enquiries; and should our first attempt to locate the required information fail we must try to make suggestions as to where the information can be located; in this way, we show commitment to serving the user public. It will also leave the impression that we are serious about the quality of service we offer. Going that extra mile will make the users realise that they have received service beyond their expectations.

Counselling: Counselling is a technique used to help a person identify the nature and scope of a problem and then explore and resolve it. In reference work, counselling is used during the reference interview to help the enquirer identify exactly what information is required. Inevitably, the reference worker's attitude will be reflected during the interview session which makes it even more important to show a positive attitude.

During counselling a collaborative relationship should develop between the reference worker and the enquirer. The reference worker should show patience and allow the enquirer to formulate his/her request to the best of his/her ability. The reference worker should listen attentively and try to see the world through the enquirer's eyes and perceptions rather than imposing values or make premature judgements. Showing warmth, empathy and respect will make enquirers feel at ease and will enhance effective communication. The principles of counselling speak of acceptance, non-judgement, active listening and reflective responding.

Personal traits: Good reference work is made up as much of personal attributes as of specific skills or knowledge. Possessing only half these competencies is not sufficient in terms of practice. Personal attributes have direct bearing on how effectively individual reference workers provide enhanced and user-friendly services. Good reference workers need to be approachable, tenacious, creative, dependable, honest and able to follow through ideas or arguments. In addition, reference workers should strive to be accurate in providing the correct information as far as the source of origin and date are concerned.

Completeness and accuracy: are other essential attributes in reference work, especially when citing sources from which information is obtained. If the source is a book, article and so forth, bibliographic details should be complete. If the source is a person from whom information was obtained, make sure you have an address or telephone number or the name of the company or product.

Expediency: is also important in reference work. Reference workers should know their sources as well as the techniques (manual and electronic) to access information. They should be well organised to access information quickly. Organisational and time management skills will enable the reference worker to prioritise tasks and to minimise stress in the workplace.

Courtesy: in reference work should be part and parcel of your interaction with enquirers. This will make any enquiry a pleasant experience for the users and will ensure that they find the reference service reputable.

2.6.2 Intellectual skills

Knowledge of reference sources – reference workers need a working knowledge of standard printed and electronic sources and subject knowledge, or knowledge of disciplines; specifically those working in subject libraries such as law libraries, patent offices and hospital libraries.

Apart from a basic knowledge of sources, reference workers should have a basic **knowledge of the different modes of access** for manual and online sources including the internet.

They should also have a **basic knowledge of the new methods of delivery.** As Unisa students you have been prepared in this regard in various modules of the Applied Information Science course (eg AIS1503 and AIS2601).

Query negotiation – the ability to discuss with the enquirer his/her information need in order to establish what exactly is required. It is during this interview that the reference worker will apply knowledge of the different kinds of negotiation techniques such as counselling, verbal and nonverbal communication, open and closed questions and paraphrasing. Query negotiation is discussed in detail in study unit 4.

Knowledge of search strategies – Search strategies are usually thought of as technical skills. However, an understanding of the theory and principles of manual and online searching and internet navigation is required in order to utilise them effectively. Unisa students obtain this type of background from various modules offered by the Applied Information Science course. We look at search strategies in more detail in study unit 5.

Creative thinking – knowledge of the different sources, tools and techniques, and the application thereof, helps you to develop creative thinking skills in that logical reasoning and imagination are involved. The ways in which information is organised in both traditional and electronic formats is a logical by-product of creative thinking. This enhances the ability to evaluate sources, search strategies, situations, users and user needs during reference encounters.

Reference workers must be able to **break down queries into manageable, logical parts** while simultaneously forging connections in the subject, organisation and the distribution of resource tools in a particular field. Creative thinking of this kind is enhanced by experience, spontaneity and a willingness to abandon established practices.

Today's reference worker must be able to experiment and **learn** along with the enquirer as new sources are explored together. He/she must be open to new avenues of searching, and willing to exceed boundaries and demonstrate initiative in seeking collaborative endeavours.

Organisational and time management skills – reference workers should be able to adapt to new management styles, user demands and advances in technology. Without the ability to adapt, reference workers will only be able to use traditional tools and will be unable to respond to changed user needs and new technologies. Furthermore, reference workers should pay more attention to the training of end users due to the impact of ICT on reference work.

2.6.3 Technical skills

Technical skills required in reference work are closely related to the instruction function of the reference worker. Many of the accessing activities in a reference service can be carried out by the users themselves; all they need is instruction in the various types of bibliographic control tools and content sources.

As a result of increasing reliance on electronic tools and advances in ICT, there is a shift towards accessing remote resources. This makes it imperative to teach users how to use information resources, connect to and travel through cyberspace and make use of networked computers. Therefore, the reference worker, whose responsibility it is to provide personal assistance, should have the technical skills to facilitate and instruct enquirers in this regard. These technical skills can be classified under the following categories:

Manual searching skills: Traditionally, instruction for library users involved teaching the use of card catalogues, indexing journals, bibliographies, and other core ready-reference sources such as encyclopaedias, dictionaries, yearbooks, directories, atlases and statistical sources. The majority of information and reference sources are still available in printed form and the principles according to which information is arranged in these sources are still valid. This is why the compilation of printed sources and retrieval tools, and the principles according to which information is described and arranged in these sources, form part of your studies in modules at second-year level (AIS1503 and AIS2601). Later, in study unit 5, you will learn how to conduct a manual search in printed reference sources. Knowledge of these skills will enable you to teach users how to access information in printed sources.

Online searching skills: The rapid growth of electronic resources such as OPACs, online databases and the internet has significantly changed the nature of reference and library instruction. The emphasis in reference work is now on training the user to use the tools of the new type of library effectively. The following are probably the most important online searching skills reference workers require: to have a good command of database languages; knowing how to narrow or broaden a search by using Boolean operators, truncation, proximity operators and relevancy rating; using controlled vocabulary; and knowing how to formulate a search strategy. (You will learn more about these in the third-year modules of Applied Information Science.)

Internet searching skills: Reference workers are increasingly expected to teach individuals and groups of users formally and informally (at the point of use) to search new computer-based systems without attending formal training classes. In order to comply with these requirements, the reference worker needs the skills to connect to various electronic networks. Reference workers need specific skills to access the vast information resources provided by the internet. Probably the most important skill is the ability to navigate the internet. We need to know: how to use web addresses and links; what strategies to follow when using software programs – such as search engines; how search engine indexing works; how to log into a remote computer and transfer a file; how to use existing online searching skills, such as Boolean logic and truncation when working on the internet. (You have been introduced to most of these in Module INS1501 and will learn more about them in the third-level modules.) The very nature of information on the internet requires skills for evaluating and filtering information to make quality judgements. You learn more about this in study unit 8 and 9 of this study guide.

Reference workers should also know how to simultaneously **download information from the internet** and create files of local information on organisations or communities (that do not exist elsewhere) to be published online for local users. Content generation (eg compiling a resource file) has tremendous potential for reference services (such as community information services) since no one else will develop this type of information in most communities.

As far as technical skills are concerned, we must bear in mind that they have temporary value and are rapidly superseded. Therefore, we must be prepared to move on constantly to acquire new skills and leave outdated skills behind. It is all very well to know about the knowledge and

skills required to offer personal assistance in the reference section of a library, but it is equally important to gain hands-on experience by carrying out tasks related to reference work. So, let's have a look at the typical activities in a reference section. You will learn that these activities are closely related to the responsibilities of a reference worker.

2.7 ACTIVITIES AND RESPONSIBILITIES IN REFERENCE WORK

Hands-on experience

Putting theory into practice

In reality, doing reference work is nothing else but putting into practice everything you have learned in theory about cataloguing, classification, indexing, verification of bibliographic details, search techniques, knowledge and skills and interpersonal relationships. We will show you how the competencies you have gained in the previous section can be applied to carry out the various activities of reference work.

2.7.1 Activities

Some tasks will require more knowledge and experience in a particular field and will be more challenging while others will be routine tasks. Whatever the case may be, reference workers will quickly learn that they have to carry out all sorts of tasks, which require knowledge and skills. Irrespective of the differences between individual institutions, there will always be a paper and a digital collection, a service point or a reference desk; and users with a variety of questions. In addition to conventional reference services, virtual reference services have generated new activities and tasks which also require hands-on experience that reference workers need to acquire.

2.7.1.1 Variety of tasks

Shelving of books

Shelving books: In smaller libraries new staff can expect to be involved in shelving books. This is a great way to learn about the collection and where things are located. In this way one quickly learns what types of sources are used heavily. While shelving items, workers might be approached by users who need help. Being familiar with the reference collection will be an advantage when you have to find appropriate items quickly in order to answer directional or factual questions.

Handling bibliographic search tools

Consulting reference materials: When searching periodicals, reference sources and other reference material, you will learn how to use bibliographic descriptions of books, articles or other items to find out where they are kept in the library.

Interlibrary loans
Verifying citations
Using digital search tools

Interlibrary loans: The same applies when assisting with interlibrary loans whereby you also need to use the bibliographic description of items to indicate to the lending library exactly which item is required. Reference workers need a clear understanding of the function of bibliographic descriptions in order to retrieve the correct information item. You learn in Module AIS2601 how a bibliographic description is compiled. This knowledge is very important since a high level of accuracy is required when searching for information on databases, and in indexes and abstracts. The accurate use of bibliographic knowledge is the basis for learning how to access digital collections. You will practise to search your library catalogue and learn which journal titles or book series your library holds. You will need to identify the appropriate bibliographic search tools and how to handle them to follow instructions. You will also learn how to use periodical reference tools or any other catalogues reflecting holdings of other libraries. If possible, it would be worth your while to ask more experienced colleagues whether you could shadow them to observe their reference style and how they use the available tools. You will apply these types of intellectual skills when guiding users to search for information by themselves. This is known as bibliographic instruction.

Apply interpersonal skills
Make quick decisions
Assist users

Answering questions at the reference desk: At the reference desk you will be exposed to all sorts of questions. This is where you will quickly learn to apply your interpersonal skills in interacting with library users. You will need to practise what you have learnt about being approachable. Listen to what people say and make quick decisions to assist users to the best of your ability. Most people with questions will be grateful to see a friendly face, whereas a user will never return to a person or place that gave them little time and effort. Offer technology training to users

Positive approach in new environment

Instruction in use of ICTs: Constant developments in information technology necessitates that reference workers assist users by offering technology training in addition to resource expertise and information-seeking instruction. Working in a digital environment requires a different approach to interviewing and applying searching or answering skills. Personal assistance to users who are not familiar with computer technology will require the reference worker to be at the point of need to teach basic computer skills such as how to log on, use the mouse, save, print, use e-mail and use multiple windows.

Cope with complex searching
Effective dialogue

More complex tasks will include assistance to users in mastering key concepts such as Boolean operators, searching relevancy, scanning full text for content and matching key words and recognising common navigational elements (eg menus are often found on the left-hand side of the web page) and understanding site boundaries and relationships between linked documents. The reference worker will also need to show users how to access the catalogue, databases electronic journals or search engines. Being able to offer instruction of this kind to users requires of reference workers to have hands-on experience of the different accessing and communication techniques in order to interact with resources and tools.

2.7.1.2 Additional skills

Web-based activities
Preformatted scripts
Co-browsing, pushing web pages, escorting remote users, transferring enquiries

Web-based activities: Real-time software requires various communication skills in virtual reference such as chat reference or collaborative services. The reference worker will apply these skills to send web pages or preformatted script messages to remote users via e-mail; walk the user through a search strategy by means of co-browsing; push web pages or escort the remote user during a real-time reference transaction. As far as collaborative reference is concerned, the reference worker will need to know how to transfer the call to other librarians who are also participating in the system.

Handling chat sessions: Reference workers need to know how to close chat sessions; make transcripts to send a written record to the user and store copies of the transcripts on databases for future use. You will learn in more detail about these skills in study unit 3.

2.7.2 Responsibilities

The nature of activities in a reference section determines to a large extent what the responsibilities of a fully trained reference worker are. Since the reference section of an information service is the area where the user comes into direct contact with the reference staff, we are inclined to think of the reference worker's responsibilities as only within the reference worker/user relationship. On the contrary, the reference worker also has other responsibilities which will become clearer from the discussion below.

Find material to meet information needs: Finding information on behalf of the enquirer was one of the first responsibilities of the reference worker and the status quo will probably remain for the foreseeable future. Library and information services still keep a core collection of printed reference works and other sources that can meet the immediate needs of enquirers, and reference workers are trained to handle these competently.

Instruction: Advances in ICT have caused a shift in accessing information from the reference worker to the end user. Since not all the enquirers are equally familiar with the use of the latest techniques and procedures to access information electronically, reference workers are increasingly required to teach users how to use the new technology to access information successfully.

Utilising resources on the networks: Apart from teaching users to access remote information collections, reference workers need to know how to identify, access and evaluate these resources in reference work themselves. So, the processes of identifying, accessing and utilising electronic resources on the networks are logical extensions of a reference worker's responsibilities.

Guiding users: The guidance function of reference work is not as prominent as the instructional function. The function of guiding users is still evident in libraries in the form of bibliotherapy (ie selecting books and other reading material to solve specific problems) in special libraries and assistance with assignment writing in schools and academic libraries. However, as more information retrieval occurs outside libraries, the guidance responsibilities of reference workers may increase since they understand the principles and techniques of information storage and retrieval better than many users. Instead of guiding users in the choice of books and other read-

ing material, reference workers will be guiding enquirers in the choice of electronic information sources – especially in the choice of search engines and directories to access subject information on the internet.

Staff training: It is the responsibility of trained staff to provide in-service training to newcomers in reference work. Each reference service has its in-house policies, techniques and procedures that are not offered in academic courses for practical reasons (eg connecting to the library's Local Area Network [LAN]). Therefore, newcomers need to be instructed in this regard. It is our responsibility to teach ourselves and others the skills necessary to access the internet as we did with other information formats in the past.

Staff training (also known as in-service training) is usually carried out by a particular library's user education department which makes use of in-house experts, campus resources and vendors (online information retrieval systems). All reference workers should go through staff training before they are certified in using the equipment and become instructors.

Reference collection management and development: It is the reference staff's responsibility to develop and evaluate the reference collection, since they have first-hand experience of the users' needs. Their knowledge of printed and electronic reference sources, internet search engines and directories put them in the best position to determine what is required for their particular reference service. Their experience with a particular reference collection enables them to decide what portion of the existing collection should remain and what new equipment and resources should be acquired.

Professional and ethical responsibility: Reference workers have a responsibility to deliver a service within the parameters of the ethical code of their profession, not only towards their user community but also towards the employer and the information profession per se. Only then will they be recognised as professionals by those outside their field.

Continuing education: The quality of a reference service is largely dependent on the competence of reference personnel. Competence is dependent on continuing education (which is covered later in more detail). In other words, acquired knowledge, skills and attitudes need to be updated. Reference workers will have to cope with new information products, new technologies and increasing quantities of information. Keeping up with current developments is critical to the level of service offered by an information service.

2.8 CONTINUING EDUCATION AND TRAINING

Adapt to change

Automation in library and information services has created new needs, expectations, obligations and problems. The result is a shift in training programmes. Reference workers are pivotal in helping users to find information. So, continuing education for reference workers seems inevitable.

Considering that access to information is vital to the world economy and quality of life, reference workers must remain competent through continuing education. In the past, libraries and information services were the major roleplayers in access to information, storage and retrieval. Today library and information services have become but one part of a rapidly expanding information industry.

Diverse responsibilities

The responsibilities, challenges and opportunities of reference workers are increasing in diversity and complexity. It is, therefore, critical that reference workers operate within the new approach which focuses on the client and his/her needs and no longer on the old paradigm where libraries were valued as good and valuable places that should be used.

Explore new resources together with end users

We must keep in mind that the concept of a stable core of reference sources and drawing from an individual collection is no longer valid. Many traditional reference sources are being replaced by new formats or totally new sources. The reference worker has to learn along with the users and explore new sources together with them.

**Venture across boundaries

Continuing education to augment knowledge and skills and to promote the right attitudes should be updated to cope with new information products, newly developed technologies and increasing quantities of knowledge. Keeping current is critical to the level of service offered by a reference worker. The reference worker must be prepared to abandon old processes and sources if the reference service is to remain relevant. We must be open to new avenues of searching, and be willing to cross boundaries.

Reference workers cannot possibly expect to continue their careers with the knowledge they gained from their original courses in information science and librarianship. There are many areas in which reference workers need continuous updating.

Rethink basic principles

The world's store of information continues to change and expand and sources that record the information are continually revised and updated. Bibliographic control tools that provide access to these sources are also increasing and changing or being adapted to comply with new technologies. As changes occur in information sources and access tools so do the needs of users of information. Therefore, the three areas in which reference workers have to keep up are sources, access methods and user needs. Continuing education will include learning experiences that will introduce new concepts and skills and update basic professional foundations.

Participate in new strategies

There are many strategies reference workers can follow to update their knowledge, skills and attitudes. The most frequently used strategies are to read professional literature and regularly attend reference staff meetings, conferences, workshops and other meetings outside the individual's regular field of reference work, such as local interest groups where mutual problems, challenges and possible solutions are discussed. Individual reference workers can also attend short courses offered at local colleges and universities. These courses range from computer and software management courses, supervisory courses and teaching skills to subject-related topics, refresher courses and updates on specific databases.

Reference workers cannot help their users to meet their information needs if they themselves are ignorant of the sources, lack the ability to access the information they know exists or are unwilling to go that extra mile to gain the knowledge and skills. Thus, continuing education and training is imperative.

Requires handling of digital search tools, knowledge of virtual reference products and systems

The monumental shift in information technology and the emergence of virtual reference services has had a fundamental impact on the training of reference workers. Roles and skills required of librarians have now changed. Perhaps the most important training required is in using internet tools to add value to existing reference services. There are two main areas where additional training is required. These are helping users to access, choose and evaluate digitised information, and having a thorough knowledge of virtual reference products and systems.

Chat and collaborative services
New protocol

Utilising the opportunities offered by virtual reference services requires of reference workers to know how to assist remote users via e-mail or in real time. This implies a new way of interacting via e-mail and text-based messages. Reference workers need to fully understand what chat reference and collaborative services entail, as well as the protocol to access and search them while the users are waiting for a response. The reference worker must learn how to log on, send web resources to the user's browser, escort the user to websites, do co-browsing, know how to use preformatted instructions to keep the user informed of the search activity, and guide him/her to web pages. The reference worker should also know how to prepare transcripts of the search strategy to be sent to the user after the search has been completed and to be placed on the database for future use.

Create templates
Prepare preformatted answers

In addition reference workers need to know how to create templates for users to complete their details and state the nature of their queries. They should also be able to prepare preformatted answers and/or instructions to guide users during a search strategy.

Develop online tutorials

Apart from understanding how to utilise modern, electronic search tools, reference librarians need training in developing tools and techniques to provide bibliographic instructions to their users. These include the development of web-based tutorials which enable users to follow instructions without the personal assistance of the reference worker. It seems that, at present, instructional skills training of staff is left to employer-provided (in-house) training (Julien & Boon 2002).

2.9 FUTURE OF THE REFERENCE WORKER

Intermediary role

Reference workers in public services, such as library and information services, will continue their roles as intermediaries, but with new demands to be proactive and up to date with the use of the latest technology and processes to access information. Advances in access technology (eg seamless access operations executed by search engines) have resulted in a partial shift of the intermediary function from the human to the machine. (The shift is regarded as partial since the computer cannot determine the exact needs of users.)

Consistent filtering off information

Since the emphasis in reference work has shifted from that of providing information to accessing information, the reference worker will become more of an 'access engineer' who controls the filtering, searching and 'sensemaking' tools we need to navigate through the expanses of cyberspace. The reference worker should be able to make sense of all types and formats of information sources and get the information to the user as quickly as possible.

Assisting end users

In future the reference worker will work with both on site and remote users to teach them the latest techniques to access information. The one-on-one assistance by appointment will continue to play a prominent role, albeit in a transformed manner. The traditional reference desk may be replaced with online expert work stations. This is already happening in larger academic libraries. (Much of this will become clearer to you after you have been introduced to online practices in other modules.)

Marketing expertise

Reference workers will also need expert communication skills, because they will have to interact with a more diverse and sophisticated population. Since the latest technology enables the end user to access information from remote locations outside the reference service (eg from offices, homes, internet cafés), the reference worker will have to convince this type of user of the value and purpose of the reference service.

2.10 CONCLUSION

The main aim of this study unit was to introduce you to the profile of a reference worker and to make you aware of what will be expected of you after you have completed your studies, which will prepare you for the job market. Despite all the expert systems and the ability of end users to do their own searching, the reference worker remains the human link required to sift and evaluate information and guide and instruct the layperson, because there will always be inexperienced new users of information services.

2.11 REFLECTION EXERCISES

EXERCISE 1

Can you think of at least four reasons that justify the role of a professionally trained reference worker in reference services today?

(1) .....

(2) .....

(3) .....

(4) .....

EXERCISE 2

Tick in the yes or no columns whether you think the following are technical skills required by a reference worker.

Skills required	Yes	No
(1) training of end users		
(2) locating information on hard copy sources		
(3) planning a search strategy		
(4) using Boolean operators to access information		
(5) navigating the internet		
(6) query negotiation		

EXERCISE 3

One of the six aspects listed in the *IFLA Code of Ethics for Librarians and other Information Workers* is **access to information**. In the context of this aspect, why do you think librarians and other information workers reject censorship in all its forms?

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EXERCISE 4

List below what you think the responsibilities of a reference worker are.

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EXERCISE 5

Can you think of reasons why continuing education and training is crucial for reference workers?

.....

.....

.....

EXERCISE 6

Which areas are crucial in the continuing education and the training of reference workers?

.....

.....

.....

EXERCISE 7

What action can information workers take to obtain relevant continuing education and training?

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2.12 SOURCES CONSULTED

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2.13 ANSWERS TO EXERCISES

EXERCISE 1

(1) The reference worker serves as an interface between the reference service and the user. Thus, the reference worker's competence enhances the credibility of the service.
(2) In some cases, users are not computer literate enough to perform an online search.
(3) Skills required to conduct in-depth searches are beyond the ability of some users.
(4) Most in-depth searches are too time-consuming for users who are busy with research activities, or users who are working as a team on a project where certain groups have certain tasks allocated to them.

EXERCISE 2

(1) No
(2) Yes
(3) No
(4) Yes
(5) Yes
(6) No

EXERCISE 3

(1) Censorship restricts or limits access to information.
(2) Censorship obstructs freedom of expression.
(3) Censorship hampers intellectual freedom.

In other words, censorship withholds people from accessing certain information or ideas.

EXERCISE 4

(1) To find information on behalf of the enquirer.
(2) Instruct users in using reference sources and conducting a self search.
(3) Select and evaluate appropriate sources and resources for reference work.
(4) Provide guidance to users.
(5) Do some staff training especially of newcomers.
(6) Develop and evaluate the reference collection.
(7) Professional and ethical responsibilities towards the employing body and the users.
(8) Continuing education to remain competent.

EXERCISE 5

(1) Adapt to change
(2) Increase in diversity and complexity of sources and products

EXERCISE 6

(1) Sources of information
(2) Access methods
(3) Needs of users

EXERCISE 7

(1) Short courses offered at tertiary institutions
(2) Attending meetings, conferences, workshops, participating in activities of interest groups
(3) Regular perusing of literature on reference work

STUDY UNIT

3

VIRTUAL REFERENCE SERVICES

A virtual reference service is a, "reference service initiated and conducted electronically, often in real-time, where users employ computers or other Internet technology to communicate with librarians without being physically present" (MARS Digital Reference Guidelines Ad Hoc Committee 2004).



Figure 3.1

Assisting a student via email
(**Source:** Unisa Library)

3.1 INTRODUCTION

In this study unit we introduce you to virtual reference services that add value to traditional reference services. You will learn about some software that is being adapted to comply with the requirements of reference work and the different features that have been developed to improve access to digital information as well as information in library holdings. The different features designed to accommodate the remote user in the search process by providing real-time personal assistance are also covered.

LEARNING OUTCOMES

After you have worked through this study unit you should be able to:

- give an account of what virtual reference entails
- explain electronic information resources
- understand the concept end-user interface
- distinguish between the different types of virtual reference services
- demonstrate what collaborative services involve

KEY CONCEPTS

Co-operative virtual: A service provided when several libraries work together to provide a digital reference collectively; it is also referred to as collaborative digital reference.

E-mail reference: It refers to the use of electronic mail communication to provide a reference service. E-mail reference can be handled by means of a web-form which allows users to send their enquiries at any time, but may be answered by reference professionals another time. In other words, the users do not interact with the reference worker in real time. This mode of communication is also known as asynchronous (Kern 2006). E-mail reference is, thus, easier to provide at all times (24/7) than chat reference which occurs in real time.

FAQs: Short for frequently asked questions, FAQs are a collection of questions people ask repeatedly. These questions are then compiled with answers and posted on a web page. The FAQ software allows the storing of incoming questions and answers or replies that are subsequently offered to the enquirers. Users are encouraged to check FAQs first, because the question they want to ask may have been asked already and the answer is waiting on the FAQ site.

Virtual reference: Synchronous electronic form of communication between the librarian and the user which includes the capability to send information in electronic form (text and images). It contains one or more of the following components: text, chat, voice and video (Lindblom, Yackle, Burhans Peters & Bell 2006; Luo 2011).

Web-based services: Refers to digital reference provided by search engines (no human interaction). The search engines provide links to other sites on the internet (eg Google).

3.2 THE VIRTUAL REFERENCE SERVICE

In study unit 2, you have been introduced to the concept of reference services. In this study unit, we add the term "virtual" in the beginning to focus on reference services that are conducted online. The terms "digital reference", "e-reference", "internet information services", "live reference" and "real-time reference" are also often used to describe these reference services (IFLANET 2006).

RUSA (Reference and User Services Association 2004) define virtual reference as a "reference service initiated electronically, often in real-time, where patrons employ computers or other internet technology to communicate with reference staff without being physically present." The virtual reference service provides people the opportunity to access library resources anytime (24/7) from any place in the world.

The first virtual reference services were launched in the mid-1980s by mostly academic and medical libraries and the service was provided through email. Internet reference was launched in 1992 when the US Department of Education developed AskERIC, one of the first formal online reference programmes. In the early to mid 1990s "Ask a Librarian" services made their appearance in the library. Today virtual reference is an extension of a library's existing reference service and may include chat, videoconferencing, Voice over IP (eg Skype), instant messaging (IM), SMS and may even be used in conjunction with embedded Web 2.0 applications such as social media (eg Facebook, Twitter, YouTube, delicious, blogs) (Arndt 2010; Del Bosque, Leif & Skarl 2012).

Synchronous and asynchronous communication

In a virtual reference service the reference transaction is a human-intermediated communication (Lankes 2006). In this course we will use the term "virtual reference service" as it includes both synchronous and asynchronous communication. Examples of synchronous communication are videoconferencing and IM communication that is taking place in real time. In asynchronous virtual reference communication is sent and received at different times such as email or texting.

In other words, synchronous communication is when patrons interact with the librarian in real time. Asynchronous communication is when patrons interact with the librarian, but they are not in contact at the same time. Their communication is not synchronised in time.

Role of virtual reference worker

The primary role information professionals play in virtual reference services includes finding, selecting, directing users, acting as gateways, and repackaging the electronically available information to the benefit of users.

Let's look at what electronic information resources are.

3.3 ELECTRONIC INFORMATION RESOURCES

EIRs

Electronic information resources (EIRs) "refer to those materials that require computer access, whether through a personal computer, mainframe, or handheld mobile device. They may either be accessed remotely via the Internet or locally" (Johnson 2012).

Mainframe
Handheld mobile device

Let's make sure everyone understands the terms "mainframe" and "handheld mobile device". A mainframe is usually a large high-speed computer (server) supporting many workstations in a large organisation. A mobile device or handheld device refers to a small, hand-held computing appliance with a touch screen or miniature keyboard such as a smartphone. It is able to run a variety of application software known as apps and can also be equipped with the following:

- Wi-Fi (a popular wireless networking technology that uses radio waves to provide wireless high-speed internet and network connections)

- Bluetooth (a low cost, short range, low-power consuming wireless networking technology commonly used in cellhones) and
- GPS (Global Positioning System) capabilities.

Types of EIRs

EIRs that may be accessed via a computer, mainframe or handheld device can be sorted according to the following main categories:

- E-books
- E-journals
- Online databases (further discussed under 3.3.1)
- E-images
- E-audio/visual resources.

Sources of EIRs

There are six main ways in which libraries can acquire EIRs, namely:

- Purchase them
- Subscribe to EIRs (ie acquire via licensing)
- Access free EIRs online or download them (eg free e-books from Project Gutenberg)
- Acquire EIRs through donations or gifts
- Obligated to deliver an EIR (eg master's and doctoral students at Unisa are obligated to provide an electronic copy of their dissertation or thesis to the library)
- Multiple format materials may include an EIR (eg a CD-ROM as part of a book)

Access to EIRs

Johnson (2012) emphasises the importance of authentication, also known as internet protocol (IP) authentication, the process of identifying the person who is attempting to access EIRs in a library. For example, when a Unisa student wants to use the Unisa library catalogue, there is no restriction, because it is an open access source. But should a student wish to access information databases that the Unisa Library subscribes to, restrictions set by the vendor require the student to identify him/herself as a legitimate user by typing in his/her name and student number.

Searching EIRs

The software allows reference librarians to request the computer to search for information that is available or indexed in electronic text. The query is typed in by using search terms. The software uses the search terms to find and retrieve articles or other information sources that contain the search term. The information sources may be located on internet websites or databases that are linked to the computer through a local or wide area network. You have been introduced to databases at first-year level in Module AIS1503 and AIS1601.

3.3.1 End-user interface

End user

When we sit down in front of our computers we click with the mouse on icons and links, we type words into search boxes and click on buttons or tick boxes and get answers from the database via the computer. This is how we interact or interface with databases containing the information we need.

The possibilities for the individual to use computers, tablets and other handheld devices to look for and find information has grown fast and has created a large group of people who are not computer experts, but who are working with computers via user software programs. These individuals would like to search successfully for information and information resources themselves; they are called end-users.

An end-user is the person who needs the result or output generated by the computer. This can include results from a database or an internet search or just a document retrieved from the **My Documents** folder on your personal computer.

End interface

A user interface is the system where interaction between people (users) and machines (computer) occur. The interface can consist of hardware (physical) and software (eg programs such as MSWord and Excel) as well as procedures and data. The interface provides a means of input, usually through a screen, keyboard and mouse. Output is the feedback from the machine that indicates the effects of the user's actions.

The user interface is designed by computer software experts and programmers. The goal of these experts is to produce a user interface which makes it easy, efficient, and enjoyable to operate in the way which produces the desired result.

Before designing the interface the designers and experts need input on what the end user want and expect. When designing the user interface, choices are made about the type of interface as well as how it should look, what should be visible on the screen and what choices a user can make.



Figure 3.2

Search screen from a database with user interface features

The expert searcher, information specialist and the librarian play an important role in training users to navigate through all the different end-user interfaces they have to face with confidence and without wasting time.

3.3.2 Databases

The number and variety of databases available have increased and are still on the increase. Initially, most databases contained indexing and abstracting services that enabled users to find research articles. There are now an increasing number of databases that give access to full-text sources, especially journal articles. Again, it was the librarians who initially performed the searches to find information in order to meet the user's information need. This is called a mediated search. Although still important for researchers with highly specialised information needs, mediated searches are becoming less common in general reference service. This is because of new developments in electronic resources such as the increased number of full-text databases and the emergence of end-user searching. You will learn more about end-user searching in section 3.3.2 below.

Types of databases

A database is a collection of data organised in such a way that its content can easily be accessed, managed, and updated. Databases can be divided into (i) **analytical databases** (primarily static, read-only databases which store material such as journal articles), and (ii) **operational databases** which allow you to modify (add, change or delete) the data on the database.

Here are some main categories of databases organised by the scope of the information they contain, namely:

(1) **Indexing and abstracting databases** – information about the item is provided such as author, title, subject, publisher and so forth (bibliographic information). The information provided is called a citation.

- Example of a citation:
  Leila June Rod-Welch, (2012), "Incorporation and visibility of reference and social networking tools on ARL member libraries' websites", Reference Services Review, Vol. 40 Iss:1 pp. 138–171
- Example of an abstract:
  This study aims at evaluating 125 research libraries in North America to identify whether they incorporate reference and social networking tools on their library's website. A content analysis of 125 library websites is conducted to determine whether libraries that are members of the Association of Research Libraries (ARL) incorporate and promote reference and social networking tools on their websites.
- Example of an indexing and abstracting database:
  SACat – SACat reflects the collection of libraries in Southern Africa and contains bibliographic information referring to books, periodicals, audiovisual items and other information material.

(2) **Full-text (aggregated) databases** – these databases provide the full text of a publication

- Example of a database:
  Sabinet Open Access Journal Collection – largest collection of South African Full Open Access Journals consisting of more than 6,000 full-text PDF articles.

(3) **Reference databases** such as dictionaries, biographies, directories, encyclopaedias, maps and so forth.

- Example of a database:
  Oxford English Dictionary (OED) – A guide to the meaning, history, and pronunciation of over half a million words, both present and past.

(4) Numeric and statistical databases
    - Example of a database
      Census Bureau databases – contains stock market information

Databases are often categorised by subject field and there are many databases for any conceivable subject.

Some of the important South African databases include:

(1) **Africa-Wide Information** – (previously Africa-Wide: NiPAD) provides users the opportunity to search across 50 integrated databases sourced from Africa, Europe and North America. Africa-Wide Information provides access to four million records with full-text links from all African countries and the surrounding islands, covering topics such as politics, economics, industry, mining, agriculture, development, legal systems, religion, health, natural resources, biodiversity, current affairs, cultural history and heritage, sport, literature, art, drama, music, and much more. If you want to see their website: http://www.nisc.co.za/databases?id=1
(2) **LexisNexis databases** – (http://www.lexisnexis.co.za/?a=g) contain information on law and taxation and can only be used on subscription.
(3) **Juta Law** – is the oldest publishing house in South Africa and has been associated with law, retailing, education and academic publishing. Website: http://www.jutalaw.co.za/.
(4) **The National Research Foundation's (NRF's) Nexus** – Database System is a collection of databases covering current research information for all scientific disciplines, for example current and completed research projects including master's and doctoral studies since 1900 onwards, NRF funded projects since 2000 onwards, professional associations as well as a conferences website (http://www.nrf.ac.za/projects.php?pid=96).

3.4 TYPES OF VIRTUAL REFERENCE SERVICES

When talking about virtual reference services, many people still think about them as a new development in the library world, but it is not quite true. Did you know that email reference has already been in existence for twenty years, while live chat has been part of our lives for ten years?

The first virtual reference service that we are going to discuss is email reference.

3.4.1 E-mail reference

Email reference is an asynchronous reference service offered by most libraries since the mid-1990s. Today e-mail reference is a popular basic service. This service does not always guarantee an immediate answer, but it is convenient for users as they can ask the question at any time of the day or night.

Advantages

Advantages for the user of this service include:

- Email can be used anytime (24/7) from any place in the world
- Users who do not have email access at home or work can access their email when they get an opportunity and the information will be available independent of the time sent.

- Users who are not able to visit a library in person can use the reference service through email
- Email provides a convenient mode of communication to persons who want to avoid a face-to-face encounter at the reference desk (eg a shy person, or a person who wants to ask a sensitive question)

Email reference also offer advantages to the reference worker, namely:

- "When questions arrive electronically, there is more time for thought and reflection.
- Questions can be answered during less busy times or by librarians who are not working at the reference desk.
- It is easier to refer questions to the resident expert with the result that the expertise of the entire staff, including subject specialists, can be tapped as needed.
- The workload can be distributed among the staff" (Ross 2009).

Disadvantages

There are two main disadvantages to email reference, namely (i) it is not always possible to tell the gender or age of the email writer, and (ii) there are no auditory or visual cues perceivable from the email.

3.4.2 Live chat and IM

Live chat and instant messaging (IM), synchronous reference services are a real-time computer conferencing capability between two or more users of a network by means of a keyboard rather than voice transmission. Online chat/IM reference software enables the reference worker and the user to communicate in real time and search together (Breitbach, Mallard & Sage 2009; Chang & Yang 2012; Johnson 2004). Each one types and transmits what he/she wants to say to the other either as a question or response, and waits for the response from the other. As with face-to-face reference services, the librarian should try to make the user feel at ease and seek to understand the user's query by replying to an answer with a request for clarification. Chat reference is sometimes known as instant messaging (IM).

Features

Chat and IM reference service has multiple features. The reference worker can:

- chat with the user
- send a URL or push (send) web pages (URL is the acronym of Uniform Resource Locator that is the global address of documents and other resources on the World Wide Web)
- take the user to websites
- co-browse databases (Co-browsing allows the librarian through a software-enabled technique to interact with a user by using the user's web browser to show them something. In other words, the librarian and user are on the same page and when the librarian moves his/her curser, the user can see what the librarian does.)
- show slide shows
- send screen shots
- transfer the chat to another reference worker
- collaborate with another professional

Advantages of chat & IM

This reference service has many advantages, namely:

- Chat/IM services allow librarians to respond immediately (Ross 2009).
- A positive teaching environment can be created in the chatroom and the reference worker has the opportunity to teach online search skills and promote self-directed learning in a multimedia environment (Taddeo & Hackenberg 2006).
- When the library is closed, virtual reference services can be provided by a librarian working from home or in another time zone (Ross 2009).
- Complete transcripts of each chat session is available and can be emailed to the user as well as be archived (Ross 2009).
- Chat/IM reference provides the opportunity to market digital resources (Taddeo & Hackenberg 2006).
- Some chatroom programmes have the advantage of being free, such as, AOL's Instant Messenger (IM) and ICQ (I seek you).

Disadvantages of chat & IM

Ross (2009) mentions the following disadvantages of chat & IM:

- As with e-mail reference, chat software does not allow you to get nonverbal clues. You cannot see or hear the user.
- Real-time virtual reference is labour-intensive.
- Some librarians find it stressful to provide live chat or IM reference, because the online user who is waiting for them to reply cannot see what they are doing or whether there is a long queue.
- As in the e-mail reference interview, communication in the chat or IM mode requires you to type each of your queries. Chat/IM is more fast-paced than email and requires typing speed as well as interpersonal skills.

3.4.3 Cooperative or collaborative reference services

Cooperative reference refers to reference services provided by referring the user or his/her question(s) to library or information personnel at another institution, according to a formally established system of protocols rather than on an informal case-by-case basis. When such services are provided digitally, the service is known as collaborative reference. Thus, collaborative reference is a type of virtual reference in which reference enquiries are routed to reference workers at different institutions based on such criteria as expertise, availability, and so forth.

Examples of collaborative reference services:
QuestionPoint

QuestionPoint – (http://www.questionpoint.org/) is a complete 24/7 real-time reference management system, integrating chat, email, and chat widget (Qwidget).

In QuestionPoint's one-on-one reference-assistance chat session, the reference worker is able to provide the following services:

- Send the client a message (original or pre-scripted, a **canned** response). For example, form of sharing that allows a user to complete a pre-formatted form or template while both user and librarian are viewing their browsers. A response may be **pushed** to the user in a pre-recorded response (a **canned** form).
- Push (send) a web page, for example in file sharing that is when electronic documents, saved in files, are transferred on the internet as an attachment. This is used during e-mail or chat reference.
- Access the QuestionPoint, a knowledge base of previously researched questions and answers.

- Co-browse a database with an authenticated client.
- Escort a client when he/she is not permitted to view a licensed website.
- Confer with or consult with a librarian who is a subject expert.
- Transfer the chat to another reference worker.
- E-mail the transcript to the client and follow up with additional information or references. A transcript is a written record of the reference interview or chat session which may be sent to the enquirer via email with the necessary privacy guidelines being followed.
- Manage the service through reporting tools (eg statistical reports or the storage of transcripts for later analysis) (OCLC 2006).

In real time, a global reference network (GRN) can be used or QuestionPoint's global knowledge base of completed answers can be consulted (OCLC 2006).

CDRS

The Library of Congress offers collaborative digital reference services (CDRs), which work on the principle that once a participating library sends a question to the system on behalf of a user; the system looks into the knowledge base for a match. If the answer is found, a response is sent to the querying (asking) library via email. If the question (including the corresponding answer) is not found on the knowledge database, it is passed on to a software program known as the request manager which forwards the query to an appropriate library selected from the profiles of the participating libraries. The library that receives the query finds the answer and sends it back to the results store (situated in the knowledge base), which, in turn, sends the response back to the asking library. The strength of the system lays in the knowledge base and the request manager components.

Weblogs

Another form of co-operation exists today in the form of social networking. For example, reference workers can use a blog to share information or knowledge management applications based on search results provided co-operatively by multiple contributors (Pomerantz & Stutsman 2006; Swanson 2006).

ipl2

ipl2 (http://www.ipl.org/) is a public service organisation and a learning/teaching environment. To date, thousands of students and volunteer library and information science professionals have been involved in answering reference questions for our Ask an ipl2 Librarian service and in designing, building, creating and maintaining the ipl2's collections. It is through the efforts of these students and volunteers that the ipl2 continues to thrive to date. In January 2010, the website **ipl2: information you can trust** was launched, merging the collections of resources from the internet public library (IPL) and the librarians' internet index (LII) websites.

3.4.4 Web-based services

The World Wide Web is characterised by the availability of vast amounts of information stored on web pages or linked databases. Internet search engines are used to access the information.

There are WWW-based services to assist information searchers. Examples of such services on the internet can be found on the following sites:

- Infopleasehttp://www.infoplease.com/

- Answers.com http://www.answers.com/
- Ask.com http://uk.ask.com
- Scholarly internet resource collections at Infominehttp://infomine.ucr.edu/
- The WWW Virtual Library, a web directory of the originator of the Web, Tim Berners-Lee http://vlib.org/
- The free encyclopedia, Wikipedia http://www.wikipedia.org/

3.4.5 Types of alerting services

Types of alert

RSS feeds

Real Simple Syndication or Rich Site Summary (RSS) is, "technology that allows content or headlines from a blog and other changing web pages, eg news sites, newsletters, journals, podcasts, publishers' homepages, subject databases, and so forth to be viewed in a software application called a feed reader or aggregator. Other names for RSS feeds are Web feeds, XML feeds, RSS channels, and syndicated content" (Unisa Library 2001).

RSS feeds are an excellent way of distributing regularly updated content without having to go to all the individual sites that interest you.

There are numerous readers available and you should choose the one that is best suitable to you. Examples of readers: Microsoft Outlook, Google reader (http://www.google.com/reader/view/) or Bloglines (http://www.bloglines.com).

A user can subscribe to a free RSS feed by clicking a feed icon in a web browser indicating the subscription process. Below is the standard feed icon used in several browsers.



In order to stay up to date with new publications you can also register for email alerts from publishers' websites, such as:

- Oxford University Press – http://www.oup.co.uk/emailnews
- Penguin Books South Africa – http://penguinbooks.co.za/rss-feeds

TOC

Many suppliers of journals provide an email alerting service for their journal titles. By selecting the journal titles you are interested in, a list of the most recent table of contents (TOC) will be sent to you on a regular basis. Many times the TOC is sent before the journal is accessible to subscribers.

- Examples:
  Zetoc Alerts (http://zetoc.mimas.uk), a comprehensive service covering nearly 30,000 journals, more than 50 million article citations and conference papers.

RefAware

RefAware (http://www.refaware.com/) – a web-based current awareness service designed to provide researchers and other members of the academic community with immediate access to new research and publications in their field – all within hours of being posted online. RefAware constantly scans the internet for the latest information and automatically delivers new information directly to the user. RefAware is a 24/7 personal research assistant and provides a comprehensive, up-to-the minute picture of today's global research.

3.4.6 Other types of virtual reference services

There are many other different types of virtual reference services and several new trends, which can be summarised as follows:

(1) **Assistance to the disabled:** Advances in information technology have benefited the disabled particularly the blind or partially sighted through the use of software that reads text on computers and cellphones. Further support is given through the DAISY (Digital Accessible Information System) project and the option to save text documents in XML. Chat reference is an ideal way to assist the deaf. Website: http://www.daisy.org/.

(2) **Mobile aids**: M-services or mobile aids make it possible to search the internet by providing **instant answers** from Ask.com's mobile site http://m.ask.com to a cellphone. Using portable or tablet PCs, PDAs, smartphones, mobile handsets or cellphones while on the move, enables roving reference work or librarians moving around a location to provide assistance from a device linked wirelessly to the internet. PDAs represent the coming together or congruence of both synchronous and asynchronous communication.

(3) **Podcasts:** Audio files that are downloadable to a computer or mp3 player. The iTunes software from Apple-Mac may be used to record and listen to files on an iPod. Similarly, there are several freeware programs that can be downloaded from the internet for use with Windows Media on a computer. Reference librarians could record instructions on how to search a particular resource or database to which the user could listen while searching the database. This would facilitate self-learning.

(4) **Preformatted answers:** In order to save response (answering time), most software allows for the creation of preformatted responses (also known as canned responses) from which the librarian can select and send responses to the user window (screen) with a simple mouse click. Preformatted responses are used for instructions such as how to connect to databases for the required information; or even standard questions used in reference interviews.

    Frequently Asked Questions (FAQs) is a text file available online, containing answers to commonly asked questions about a specific topic. Such answers also serve as a mini-help file for inexperienced users of a computer system or software program. They are usually maintained by one or more people who have an active interest in the subject. Searchable FAQs make it possible to store incoming questions and answers and respond to them in text format on a knowledge database. FAQs (eg how to access data bases remotely, or the hours during which the library is open) can easily be answered automatically and in this way cut down on the number of requests that need human assistance. Another variant of preformatted answers is where predetermined answers are provided without any human intermediary. Most of these services provide free access to various online sources and allow users to either select a specific source or conduct a search of a range or all the reference sources.

(5) **Roving reference work:** Future library clients may increasingly use Wi-Fi connections to communicate with reference services from any place anytime. A roving librarian could use a PDA, laptop or tablet PC equipped with a wireless network interface card to answer the reference queries of users in the library who do not wish to consult a librarian face-to-face at an information desk (Smith & Pietraszewski 2004). A similar mobile reference service could be offered at other locations on a university campus such as coffee shops, student centres or residence halls, information commons or study centres (Lee Hisle 2005). It is important to deliver reference services at the point of need of library clients in a hospital, a business organisation or a public library through citywide wireless networks (Abram 2006; Burnette & Dorsch 2006; Gadsby & Qian 2012).

(6) **VoIP:** Voice over Internet Protocol is software that allows people to speak to one another via the internet, such as Skype and Google Chat. The software is usually downloadable from the internet at no cost – **talking** on the internet with text messaging and files sharing being used in addition to its audio features. The online presence of other people known to the participants is announced (in real time) on screen. In the instance of two participants, a webcam can be used to see each other. It can also be used to make a conference call with more than two people participating simultaneously. However, viewers are no longer able to see one another via webcams.

3.5 IMPLICATIONS OF VIRTUAL REFERENCE SERVICES

Although virtual reference services are only supplementary to traditional reference services, many libraries and information science professionals have, to some extent, turned their attention to providing electronic reference services. Several libraries, especially academic libraries, have used or adapted chat or commercial call centre software to make optimum use of the technology available and the experience and expertise of humans. However, it is doubtful whether digital libraries can totally replace human experts and personal services. Nevertheless, there are certain consequences of providing a virtual reference service as described below.

3.5.1 Skills and competencies

(1) **Information literacy training:** User training or information literacy training needs to be conducted regularly. Sophisticated online tutorial programs, e-seminars or webinars using digital video technology such as Webex may be used to assist users. Such technology can also assist the reference worker in improving his/her own searching skills, particularly in keeping abreast with developments on databases provided by overseas vendors who may not be able to provide hands-on training. Every opportunity should be taken to assist users in becoming information literate and such technology could also be used to train remote users in information literacy.

(2) **Appropriate skills and competencies:** Reference workers should be open to anything that enhances user services and enables them to serve users to the best of their ability. They should be prepared to experiment with all new advances available in order to stay on the cutting edge. Reference workers will need to adapt their training to obtain appropriate skills and competencies in order to remain relevant in the sphere of personal assistance in the new reference environment. They should also become more knowledgeable of the relevant software packages for virtual reference services.

(3) **Online tutorials:** As clients co-browse with reference workers through resources, their need for training will increase. Reference workers can use multimedia techniques such as podcasts and vodcasts (ie video podcast) to transmit information literacy training, including search techniques and the use of subject databases. The training can be delivered through online tutorials on a web page or via audio files or videos. Users can store the material on DVD or another removable storage device such as an iPod or mp3 player; or listen to it on a mobile phone at their convenience.

(4) **End-user training:** Recent research on the online behaviour of users has re-emphasised the need for user training and assistance in online searching. The very nature of the new technology implies that reference workers will increasingly be involved in user training. It is important that users understand how to search databases effectively and that they also evaluate results retrieved from search engines which are increasingly able to perform contextual searches.

The very nature of the new technology implies that reference workers will increasingly become involved in user training. Searches will become more trying than before since end users will take care of keyword searches where search engines provide factual information. But, all in all, there is an exciting future for virtual reference services.

3.5.2 Access and delivery

(1) **Web access management:** As users may want to access a library's information resources from a remote location, their authentication becomes important, especially when they are accessing resources that are licensed to the subscribing library (eg subject databases) for a large fee. For example, academic libraries require student or staff identification and registration to enable off-campus access. Web access management software is used in such instances.

(2) **Open access:** The information provided by such databases is described as being part of the deep Web or invisible internet as it is not available to the public. The trend is to move to "open access" of scholarly publications and the free dissemination of knowledge. This permits the downloading of journal articles without requesting a fee, the publication of the article has been paid for by the author's research subsidy or some other publication model.

(3) **PDF:** Documents are transported across the internet or attached to e-mails in a format known as portable document format (.pdf) supported by a free reader – Adobe Acrobat Reader. This format or the use of other software to compress (zip) files reduces the size of file attachments which is important if you are delivering a virtual reference service to users who do not subscribe to networks with broadband.

3.6 CONCLUSION

In this unit you have been introduced to some of the latest advances in reference services, namely digital reference. It is important for you to realise that virtual reference services will increasingly be in demand. The focus should not be on the **place** but on providing a **service**.

This will require that you, as a reference worker, possess new skills to access the new information systems and knowledge of how to filter information and repackage it to meet the needs of the new generation of users.

This is the end of topic 1. The next topic focuses on searching for information.

3.7 REFLECTION EXERCISES

EXERCISE 1

Name six other terms you could use when searching for literature on virtual reference services:

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EXERCISE 2

In which areas has virtual reference improved traditional reference services?

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EXERCISE 3

Identify and describe three new trends in virtual reference services:

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EXERCISE 4

Identify and discuss the areas in reference services where virtual reference has an impact.

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EXERCISE 5

What is your view on the replacement of traditional reference with virtual reference services?

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3.9 ANSWERS TO EXERCISES

EXERCISE 1

(1) Chat reference
(2) E-mail reference
(3) Online reference
(4) Real-time reference

(5) Virtual reference
(6) Web-based reference

EXERCISE 2

(1) It offers ease of access/convenient services.
(2) Users can do their own searches.
(3) It extends reference services beyond the physical library services.
(4) It provides access beyond office hours.

EXERCISE 3

(1) Automatic question-and-answer services without human involvement which primarily provide web-based information.
(2) Real-time digital services – interactive assistance where a librarian, reference worker or an expert is involved.
(3) Collaborative reference services where personal assistance is given in real time by subject experts involved in the consortium. Collaborative reference provides access to the collections of participating libraries in contrast to web-based information provided by automatic services.

EXERCISE 4

(1) Increase in virtual reference service as the *de facto* mode of providing reference services.
(2) Reference services will make optimum use of available technology (software packages), experience and the expertise of reference workers and will also influence the advancement of more sophisticated technology for reference service.
(3) New skills, competencies and knowledge of appropriate software packages will be required of reference librarians.
(4) There will be an increased need for user training and assistance in online searching.
(5) End users will increasingly conduct their own keyword searches and will make less use of reference desk appointments.
(6) The need for information literacy training will increase to ensure high relevancy in searches.

EXERCISE 5

(1) Efficiency is welcomed.
(2) Traditional services will still be required, because of the need (a) for person-to-person interaction, (b) to cater for users who are not technology-savvy yet, and so forth.

TOPIC 2

Searching for information

In the second part of the study guide, the topic we are dealing with is the ability to search for information effectively in order to save both the reference worker and the enquirer time and effort. In order to do this, it is important that you understand what the reference process explained in study unit 1 entails. It is also necessary to apply your knowledge of reference sources and bibliographic control tools and of descriptive cataloguing and classification. You have already been introduced to these in Module AIS1503 and AIS2601. You will also need to use the information handling skills you learnt about in Module INS1501.

In the first study unit of study unit 4, you are introduced to the reference interview, the interview structure and how to conduct a reference interview. In study unit 5 you will learn about the second subprocess of the reference process, namely the search strategy. You are introduced to the consecutive steps that are followed to plan and implement a search strategy. The knowledge and skills you will obtain from these two study units (4 and 5) will be reinforced in study unit 6 and 7 as you will apply them in actual searching situations.

Information searching to answer reference questions is one of the major activities of reference service. As explained in study unit 2, you, the reference worker, need to be proficient in finding information for your users. You have to be confident in finding information in all types of sources – printed, electronic and internet sources. You will find that manual searching methods differ considerably from online searching especially when using controlled vocabulary methods for online searching. So, despite the fact that you will learn the basic principles of online retrieval in the third-level AIS modules, you will be introduced to online searching in study unit 6 of this module.

The nature of the internet means that the approach for searching the internet differs remarkably from conventional (and more sophisticated) online searching. The methods for searching the internet will be introduced to you in study unit 7. After you have worked through the units of this part of the study guide, you will be able to distinguish between the three search methods (ie manual, conventional online and internet searching) and you will be able to apply the tactics for the different search methods.

CONTENTS

STUDY UNIT 4: Reference interview
STUDY UNIT 5: Search strategy
STUDY UNIT 6: Online database searching
STUDY UNIT 7: Searching the internet

STUDY UNIT

4

REFERENCE INTERVIEW

The reference interview is the conversation that takes place between the reference worker and the enquirer to determine exactly what the enquirer's information need is. The reference interview entails query negotiation to clarify the problem.



Figure 4.1

Reference interview
(**Source:** Unisa Library)

4.1 INTRODUCTION

In this study unit we are going to focus mainly on the role of the reference interview as one part of the reference process. We also cover the interviewing techniques and skills required as they apply to traditional reference work. In addition, you will learn about the reference process in digital reference work and how the interview differs from that of traditional reference work.

LEARNING OUTCOMES

After you have worked through this study unit you should be able to:

- explain what the reference interview entails
- understand why a structured interview is necessary
- identify the different interviewing techniques
- distinguish between the different types of interviews
- be aware of the utilisation of e-mail in reference interviews

KEY CONCEPTS

Active listening: Listening attentively to the contents of a query.

Attentive behaviour: Paying full attention while handling a reference query. This includes paying attention to nonverbal communication.

Counselling: Using specific techniques to help another person identify the nature and scope of a problem.

Empathy: Ability to envision an enquirer's circumstances or way of perceiving a particular condition.

Negotiation technique: Asking questions to determine an appropriate search strategy.

Neutral questioning: Involves questions to confirm a statement or change the direction of a search.

Nonverbal communication: Exchange of unspoken, but clearly observable signals (eg body language) during a conversation.

Open and closed questions: An open question which enables a respondent to expand on a topic under discussion. A closed question confines the respondent to a brief reply such as yes or no.

Paraphrasing: Repeating a question/statement in different words of a similar meaning.

Reference interview: A discussion between an enquirer and reference worker to establish the specific information that is required.

Verbal communication: Exchanging messages through speech supported by nonverbal behaviour.

4.2 DEFINING THE REFERENCE INTERVIEW

The reference interview is the conversation that takes place between the reference worker and the enquirer to determine exactly what the enquirer's information need is. This conversation may be brief, as short as three minutes, or lengthy, as long as 20 minutes, depending on the specific enquirer's circumstances. Some enquirers are able to clearly and quickly articulate what they are looking for; or the information they need. Other enquirers are not even sure what they want and the interview helps them to clarify their information need. Ross (2009:3) says that, "the purpose of the interview is to elicit from the user sufficient information about the real need so that the librarian understands enough to begin searching". Thus, the reference interview entails query negotiation to clarify the problem. The reference worker must, therefore, have a good understanding of the information-seeking behaviours of people.

Initial contact

Usually the reference interview takes place at first contact with the enquirer. However, the interview or interaction with the enquirer can continue right through the other steps of the reference process, that is, during the actual search and after the information or information sources have been located and presented to the enquirer.

Need for negotiation

Not all enquiries need a comprehensive interview. Some enquiries call for short factual answers or referral to the location of a reference source or access facilities. Others may require a fairly comprehensive search of literature, which calls for an extensive interview. Later on in this study unit, you will learn more about the different types of interviews for the different types of enquiries. Since the basic principles apply to every enquiry, the reference worker should know what the reference interview entails in order to decide how to approach each enquiry.

Reference process

Transactions related to the reference interview process (and to the search strategy to a lesser degree) revolve around the enquirer and the reference worker. The enquirer has an information need that has to be formulated precisely to be translated into searchable terms. Although the reference worker has knowledge of reference sources and is experienced in search techniques, he/she is ignorant of the background that gave rise to the expressed query.

4.3 PURPOSE OF THE REFERENCE INTERVIEW

Personal assistance

In the reference interview, the reference worker's goal is to determine the nature, quantity, levels and format (eg print, pictures, diagrams, or statistics) of information required in the most efficient and productive way. All this is required to provide personal assistance to the enquirer and to plan a search strategy or give instructions to the user on how to search by him/ herself.

Interview required

Therefore, an interview is necessary to establish what is needed and a search strategy is necessary to try to find the required information. Thus, the reference process is essentially a process of interpersonal communication with the specific purpose of meeting someone else's information need.

4.4 MAIN STAGES OF THE REFERENCE INTERVIEW

Stages: query negotiation, locating information, presenting the answer

The reference interview goes through three basic stages that include question negotiation (necessary to clarify the exact problem), locating the information to answer the question or solve the problem and communicating the answer or closure of the interview. It is important for the reference worker to remain in contact with the enquirer during all three stages, because the interview may continue through the whole reference process, but each time with a different purpose as explained below.

Interaction

At the beginning of the interview the aim is to clarify the problem or the information need. During the second stage, while the search takes place, it may be necessary to negotiate to determine whether the search is on track or whether there should be a change in direction (eg to narrow or broaden the search). Once the information is found, there is opportunity for a post-search interview to make sure that the information is relevant and sufficient.

It should be borne in mind that reference interviews do not always progress through these stages in a simple linear manner. For example, it could happen that the information is not available in the requested format; or finding the answer may require more time than may initially have been estimated; or the reference worker may realise that it would be better to refer the enquirer to an expert on the topic of the request.

Whatever the case may be, it is important that we understand what happens during each step and what approaches and techniques are followed to ensure successful completion of the reference process. Therefore, a more detailed discussion of the reference interview during the three basic steps is provided below.

4.4.1 Query negotiation

Interview structure: interviewing techniques

In this section we will deal with two distinctive aspects of query negotiation, namely:

(1) the number of questions posed by the reference worker during the reference interview to guide the negotiation process
(2) the techniques applied to make the reference interview a pleasant experience

Framework: set of questions

As stated earlier, the purpose of the reference interview (specifically the query negotiation step) is to establish what exactly is required by the enquirer, but also to help the reference worker decide how to plan the search strategy and which sources to select for consultation. Therefore, the reference worker should have a number of specific questions to pose to the enquirer during the interview. These questions will serve as a framework for conducting the interview in an orderly manner. In this way, the amount of time wasted will be limited to a minimum and the chances that the interview may degenerate into friendly chitchat will be minimised. The questions can be based on the structure of the reference interview given under 4.4.1.1 below.

Negotiation techniques

During the negotiation process, the reference worker will apply a number of negotiation techniques

to put the enquirer at ease and make the negotiation process a pleasant experience. In this section we will introduce you to the issues in a structured interview and the techniques applied during the negotiation process.

4.4.1.1 Structure of the reference interview

Decision-making questions

During the query negotiation stage, the reference worker has to take a number of decisions about the types of sources available in the information system (local collection or remote collections), the types of search tools available and the nature of the enquirer's information need or preferences. Years of experience have shown that questions on the following topics cover the most important issues to ensure a fairly structured search in a local collection of printed sources:

- **Subject:** Once the subject of an enquiry is known, the reference worker can decide which category of reference source to consult. For example: a biographical source would be consulted for an enquiry regarding the life history of a well-known person.
- **Purpose:** Questions about the purpose for which the information is required give an indication of the nature of the information that must be sought.
- **Amount:** By establishing the purpose for which the information is required, you obtain an idea of how much information on a subject has to be provided. This can be confirmed with the enquirer by a couple of neutral questions in this regard.
- **Format:** Questions about the form in which the located information should be provided enable the reference worker to decide on the nature of the reference source to consult, that is, whether the information should take the form of text, tables, statistics, graphs, or illustrations. For example, to answer a query about a specific place, the enquirer may prefer the information in the form of a road map, textual description, or pictures of the place.
- **Period:** If a time specification is given with the request for information, the reference worker will be able to determine whether a source should be consulted that provides retrospective or current information. Often the time aspect can be ascertained from the original query in which case it will be unnecessary to ask a question about it in the reference interview.
- **Time:** The reference worker must establish how urgently the information is required in order to decide whether to tackle the query immediately or whether more time should be spent on consulting more sources and presenting the information at a later stage.
- **Language:** It is important to establish the language in which the required information should be provided. It would be useless to offer information to an enquirer in a language the person cannot understand. In serious cases the information may be so important that translation services may be required. It is, however, not a cost-effective service to run in view of the number of questions received at a reference desk. The translation of information is limited to the information services of research or industrial institutions.
- **Sophistication:** Since information is produced at different levels of sophistication, it is important that the reference worker determines the level at which the information should be presented. A researcher may require information in a sophisticated form while a technician may require the same information packaged in a much simpler form. Therefore, the type of enquirer will also determine how sophisticated the required information should be. For example: the reading and comprehension levels of children are not sufficiently advanced for them to digest information of the same degree of difficulty than adults.
- **Availability:** The reference worker should establish whether the enquirer requires only a refer-

ence to sources containing the information, or whether the information itself is required so that he/she can determine what kind of source to consult. For example, bibliographic control tools such as bibliographies, indexes, or catalogues provide reference to information while content sources such as dictionaries and encyclopaedias provide the actual information.

- **Scope:** The reference worker has to establish how comprehensive the required information should be in order to decide on the range of sources to consult. Questions concerning the comprehensiveness of information will also take the purpose for which the information is required into account.

We have now covered the key issues about which the reference worker should question the enquirer during the reference interview. These issues form the parameters within which the search strategy should be planned.

Interviewing atmosphere

During the actual reference interview, most of these questions should come up in a natural progression. The enquirer should not experience the query negotiation as an interrogation. Although experienced reference workers pose these questions with greater ease, any trained reference worker should be able to handle questions on these issues successfully by listening attentively and by being fully conversant with the reference sources. While listening to the enquirer, the experienced reference worker is already deciding which one to consult. These techniques are discussed below.

4.4.1.2 Interviewing techniques

Purpose of techniques

The purpose of applying interviewing techniques during the query negotiation step is to encourage dialogue between the enquirer and the reference worker. Although the negotiation process involves questioning of the enquirer, the intention is not to confront the latter in a negative sense, but to make the enquirer comfortable. Negotiation techniques should be applied as in a normal conversation rather than a therapeutic situation.

Learn negotiation skills

Query negotiation is a skill acquired from experience. Successful negotiation depends on a reference worker's tact, empathy and general ability to communicate. Keep in mind that the techniques and methods of analysing an enquiry, deciding where to search, or how to give guidance can be learnt. However, they cannot be applied as hard and fast rules. Techniques used by experienced reference workers are frequently based on perception and experience. The background to each enquiry requiring negotiation will determine how the different techniques and methods should be applied. These techniques will be discussed separately below:

- **Counselling:** Counselling involves helping someone identify the nature and scope of a problem, then explore and resolve it. It is an understanding that enhances collaborative relationships between the reference worker and the enquirer. Counselling supports self-awareness, it speaks the truth, it waits patiently and it follows rather than leads. The principles of counselling speak of acceptance of the client regardless of approach, no judgement, active listening and reflective responding (Fine 1997:79).
- **Active listening:** The only way to receive the message and be capable of interpreting it is to listen attentively to the content of the enquiry. Reference workers should practise this consciously, because while listening to the stated question they intuitively attempt to link it to a potential source of information – thus analysing and systematising elements of the enquiry

as a pre-run to the search process. This manner of half-listening to the enquiry can result in a premature decision on what the enquirer wants which could lead to embarrassment for both parties. Effective listening consists of careful listening, showing the user that you are listening by responding with verbal as well as nonverbal indicators.

- **Empathy:** This is the ability to put oneself in another person's position to understand his/her reactions to and perception of a particular situation. An enquirer may be using a reference service for the first time, or he/she may have to communicate in a language he/she does not use every day. This may contribute to an impression of being ignorant and lacking self-confidence. By appreciating this and acting tactfully, the reference worker can create an atmosphere of mutual trust.
- **Attentive behaviour:** This implies that the reference worker should pay full attention to the enquirer during the negotiation process. A friendly facial expression, a nod of the head and positive body language in general will assure the enquirer of the reference worker's attention – of course, exaggerated nodding, smiling, or eye contact is likely to be experienced by the enquirer as feigned interest and can do more harm than good to the negotiation process.
- **Verbal and nonverbal communication:** In considering verbal communication as a technique, we refer to the attitude that is conveyed through tone of voice and articulation. The reference worker's manner of speaking should demonstrate his/her sincere intentions and reassure enquirers that he/she will not invade their privacy with a particular type of question.

  Nonverbal communication comprises unintentional behaviour that becomes evident when two people are talking to each other. This is usually used in support of verbal communication by a speaker. Discernible aspects of nonverbal communication include:

  – **The way we use our bodies** – heads, arms, and legs, as well as facial expressions (eye contact and smiling), posture and movement
  – **The way we use interpersonal space** – the distance we stand from another person; body orientation such as leaning forward or turning aside
  – **How we say something** – the pitch, rate loudness and inflection of our speech
  – **The way we time our verbal exchanges** – the way we manage turn taking; duration of turns and duration of pauses
  – **The way we look** – the formality or casualness of clothing styles; the use of accessories and cosmetics (Ross 2009:50)

  Nonverbal communication is normally used to emphasise a statement or show emotions. Reference workers may use it deliberately as a negotiation technique in certain cases to control the reference interview. For example, a nod of the head can be used to confirm a statement, or a smile to encourage conversation. Thus, being aware of the role of nonverbal communication, reference workers can use it as a technique to control the reference interview and guide it to familiar territory.

- **Open and closed questions**: The reference worker's questioning technique consists mainly of open and closed questions. The open question is used to obtain more information from the enquirer such as the purpose, amount and time in order to define the initial question more clearly. The open question technique is normally used in the first part of the reference interview. While the enquirer does the talking, the reference worker is able to identify the subject clearly and simultaneously decide which sources to consult.

  Closed questions are mostly used towards the end of the reference interview when the reference worker wants confirmation from the enquirer on a number of questions posed, for example 'yes and no questions'. Closed questions serve a dual purpose: firstly, to control

the course of the interview so that the interview does not take too long at the expense of other enquirers waiting and, secondly, to determine how much information is required. The reference worker uses both open and closed questions as a control technique to obtain a full and accurately articulated enquiry. Keep in mind that there are appropriate times for asking these types of question during the negotiation process. A closed question asked too early in the interview may point the search process in the wrong direction, whereas too many open questions may result in a long, drawn out discussion that can easily deviate from the issue under discussion.

- **Neutral questions:** Neutral questions involve the type of question that results in confirmation of a statement made by the reference worker on the topic under discussion. For example: "A copy of the journal article is all you want to study at the moment?" or "Would you also like to consult an atlas to establish the position of Calcutta?"
- **Paraphrasing:** This is a way of repeating a question or a statement in one's own words to show the enquirer how you interpret it, and that you have listened. Paraphrasing enables the enquirer to provide feedback which, in turn, enables the reference worker to either modify the structure of the interview or to concentrate on a specific aspect.

Some common causes of communication mishaps:

- **Not acknowledging the user** – by, for example, restating the initial question
- **Not listening** – inexperienced interviewers sometimes talk more than the user.
- **Playing twenty questions** – rather ask questions that make sense than guessing questions such as, 'is it this? Is it that?'
- **Interrupting at inappropriate times** – if you are interrupting or cutting off the user in the middle of his/her explanation, it can cause loss of communication
- **Making assumptions** – assumptions based on the user's appearance or premature diagnosis of the problem can disrupt the communication (Ross 2009:15)

4.4.2 Searching for information

The reference interview is not completed after the initial step of query negotiation. Searching for information is the second stage of the reference interview whereby an actual search is conducted to locate the required information to answer the question, or to progress towards a solution of the problem.

Continual interaction

Although the actual search for information will be discussed in detail in the next study unit, it is important to mention here that interaction with the enquirer continues right through all the steps of the reference process. As the actual search – if attended by the enquirer – progresses, the interview may change to questions focusing on the search activities which are necessary to direct the search. During this step more neutral questions will be posed to determine whether the search has to be broadened or narrowed.

4.4.3 Response to the search

Post-search negotiation

Once the reference worker has located the appropriate information to answer the query, the response must be communicated to the enquirer effectively. Communication of the answer to the enquirer

is the final stage of the reference interview. Here too the nature of the interview differs from that of the initial query negotiation. Depending on what has been found, the reference worker may suggest guidelines on how to find more information on the topic if required. It may be necessary to refer the enquirer to a more appropriate source of information such as another organisation or a person who is an expert on the topic.

Pending the enquirer's response, it is possible that the results of the search may trigger a change in the request for more information. It may also happen that the search turns up irrelevant information due to a poorly formulated question or misinterpretation of the question. All these circumstances may call for renegotiation of the question, which we refer to as a post-search interview.

Should the information provided prove unsatisfactory, the enquiry will have to be renegotiated to establish the reason which could be one or more of the following:

- **Faulty interpretation:** Should the subject of the enquiry be identified incorrectly during the first step of the reference interview, it could result in an incorrect or incomplete answer. An incorrect interpretation of the enquiry may result from the poor or ineffective application of negotiation techniques. The error will only be detected when the information located is presented to the enquirer.
- **Enquiry calls:** for a large-scale search. Some enquiries may be of such a nature that the initial search has to be extended far beyond what was first foreseen. Or, it may turn out that the required information is not immediately available and has to be requested from elsewhere. In such cases the enquiry has to be re-discussed to inform the enquirer of alternative sources of information or to arrange to provide the answer at a later date.
- **Enquirer develops new ideas**: In evaluating the information presented, the enquirer may gain new ideas to pursue, thus, modifying the information need. This might necessitate a renegotiation of the query in order to locate other or additional information.
- **Requested information classified:** During the search it may be discovered that the required information exists, but may not be available for security reasons. Consequently, the enquiry will have to be re-discussed to obtain comments from the enquirer.

4.5 TYPES OF INTERVIEWS

The different types of enquiries directed at reference workers call for a variety of approaches to the reference interview. The approach often has to do with the type of reference service offered and the type of user who makes use of a particular type of service.

Reference interview

- **Ready-reference interview:** In a ready-reference service answers to short factual questions are required. The goal is to provide accurate information in a short time. Therefore, the reference interview will be of a fairly simple nature merely requiring confirmation of the information that is needed. Usually the enquirer is invited to return to the reference desk if the suggested source does not meet the requirements of the enquiry.
- **Research project:** Research usually involves in-depth coverage of a topic whereby a variety of questions are posed. A number of sources need to be consulted and the information located needs to be evaluated carefully to ensure that only relevant sources will be provided. The reference interview with a researcher could include a number of smaller interviews at different stages of the research process. This requires the reference worker to keep track of sources consulted and procedures followed during searches for the particular case.

- **Current awareness services (CAS):** are aimed at keeping groups of users up to date with information in their fields. Periodicals, as current sources of information, play an important role in CAS. The overwhelming abundance of periodical literature makes it extremely difficult to keep up to date in particular subject fields. In order to overcome this problem, various types of CAS based on the contents of the latest journals, are available. You will learn more about current awareness services in later AIS modules.

  As far as the interview is concerned, the users of these services are asked to identify subject areas as specifically as possible and to identify the publications or works of specific authors to be reviewed regularly on their behalf. The initial interview can be enhanced by a list of possible sources for searching such as the thesaurus for a subject database or a list of available journals. An evaluation interview should be conducted after the initial search results have been delivered and at least annually thereafter to ensure that the materials or citations forwarded are indeed helpful (Sutton & Holt 1995:46).

- **Reader's advisory interview:** The reader's advisory service is focused on helping readers find fiction and non-fiction materials they want to read, listen to or view for pleasure The reader's advisory interview resembles the reference interview in that it also requires the reference worker to be approachable and use appropriate questioning and listening skills. The reference worker will engage the user in conversation about the kinds of books or materials he/she enjoys and does not enjoy. The reader's advisor needs to listen to clues about the reading taste and personal preferences in the comments that the user makes about his/her experience with books (Ross 2009:235). Sometimes it might be a good thing to find out about the user's reasons for seeking recommendations.
- **Information and referral (I & R) interview.** The purpose of an I & R service is to guide the enquirer to government or private agencies that have the expertise or services needed. The type of information involved has to do with basic human needs that can be critical. Therefore, effective, discreet questioning is extremely important in the I & R interview, especially to clarify the nature and scope of the request (Sutton & Holt 1995:47).

Counselling

In sensitive crises situations, it is important that the reference worker apply counselling techniques such as empathy and attentive behaviour and pose neutral questions, because it promotes pragmatic solutions to the enquirer's needs. When presenting an answer, the reference worker should provide written details such as telephone numbers or addresses as well as alternative sources of information.

Personal assistance

Floor walking; roving

- **Individual instruction.** Instruction is another form of personal assistance for which demand is currently increasing where searches are conducted by the end users themselves. In such cases the enquiry revolves around the need to know how to use specific reference tools, for example the online catalogue (OPAC), databases or the internet. Here it would be polite to ask the users if they would like assistance, or if they are finding the information they need. Assistance offered in this manner is known as floor walking or roving. The reference worker should be prepared to be asked for direct instruction at the work station by the user.

Explanations on the spot

During instructional interviews, the reference worker should explain or demonstrate each step carefully and make sure that the user follows the steps and options given on the screen. The

amount of instructional information included in the reference interview depends on the nature of the question, the user's knowledge, experience and interests, the library's policy on instruction and the expediency of the situation (Sutton & Holt 1995:48).

Interviews for complex searches

- **Database search interview.** The online database search interview involves the translation of keywords and phrases that can be converted into the controlled vocabulary of the specific database and developed into an efficient search strategy – prior to the actual search. The online search interview also includes explanations of Boolean logic (discussed later in study unit 6). During the search the interview involves the clarification of concepts and interpretation of results by the enquirer as the search progresses – if the enquirer is present.

Interviews for instruction

Purposes

- **Database searches are usually done by end users themselves.** This search operation may also require a pre-search interview, but with the purpose of instructing the enquirer in using the equipment and performing the search. During this interview, terminology is explained and the search procedure is outlined. During the search – especially in the case of a first-time user – the reference worker can be called on to repeat steps in the search procedures; or to discuss results as the search progresses. The nature of the search largely depends on the searcher's skills, the urgency of a particular search and the institution's policies on service levels (Sutton & Holt 1995:49)

Personal interview over distance

- **Telephone interview.** The structure of a telephone interview is similar to that of an in-person interview except that nonverbal communication cues cannot be experienced over the telephone, so pleasant voice tones become even more essential to compensate for the absence of nonverbal support. All the components of a standard reference interview are applicable.

  Paraphrasing should also be used frequently to confirm understanding of a statement. You should make a point to provide factual information as accurately as possible by repeating facts such as telephone numbers or asking the receiver to repeat the points you have made to ensure the message is understood correctly.

- **Electronic mail interview.** The use of electronic mail to obtain information is increasingly popular. It differs from face-to-face reference encounters because neither the enquirer nor the reference worker has to be physically present when the request is received (refer to study unit 3). Remote users present their queries via e-mail and receive responses and answers via e-mail. The reference interview proceeds in a number of emails as the reference worker refines the search strategy. One of the ways of streamlining the reference interview is to use forms – similar to those used for current awareness services – the enquirer can complete to state the reference query and some more information. Some of the reference worker's responses can also be prepared beforehand (preformatted). Often an electronic mail service has been linked directly to the online public access catalogue (OPAC) enabling the user to start the reference request from the OPAC.

The advantage of e-mail requests for the reference worker is that written requests force the user to think about the request a bit more carefully before formulating the query. In this way the information need can be defined more clearly.

A drawback is that the nonverbal communication cues which are so important in a face-to-face reference interview are not present. However, standardised electronic iconic representations (known as **emoticons**) can be used to replace body language to an extent.

Examples of commonly used emoticons in table below:

Emoticon	Meaning
:-) or :)	Indicates a smile
:-(or :(	Indicates a frown
;-) or ;)	Indicates a wink
QQ	Indicates crying
:-###.. or :###..	Indicates being sick
:-o or :o	Indicates surprise, shock, yawn
:-D or :D	Laughing, big grin

These icons form part of the basic manners and conventions (called netiquette) used in polite informal electronic communication.

The presentation of an answer takes place through written feedback, of course. E-mail has the advantage that intermediate results can be sent to the enquirer for inspection and comment; transmitting search results to a user electronically also saves time for the reference worker, since they do not need to be printed for mailing or telefaxing to a remotely located enquirer.

4.6 CONCLUSION

In this study unit you have been introduced to models of the reference interview, the variety of which indicates how IT has impacted on our understanding of the process. We also discussed where the reference interview fits into the broader picture of the reference process. You have also learnt about:

- the various stages at which interviewing is required
- types of questions that need to be asked in order to structure the interviewing process and plan the search strategy
- situations where interviews are required

4.7 REFLECTION EXERCISES

EXERCISE 1

In your opinion, what are the advantages of a structured reference interview?

.....

.....

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.....

EXERCISE 2

Complete the following statements by providing the appropriate words selected from those given below:

counselling, paraphrasing, empathy, roving

(1) Due to a terrible flash flood, Leonard lost a book he had borrowed from the local library. The library also suffered damages as a result of the flood. So the librarian had ..... with Leonard and did not charge him the full penalty for lost materials.
(2) By repeating Nina's question in her own words, the information worker applied a form of .....
(3) Sarah is in a ..... session with an enquirer who finds it really difficult to explain the situation for which he needs the particular information.
(4) Walking among users who are doing searches on their online work stations in order to assist with queries is known as .....

EXERCISE 3

Indicate whether the following statements are true or false, by ticking in the appropriate block.

Statement	True	False
(1) The telephone interview is similar to an in-person interview, except that the body language cannot be experienced		
(2) An e-mail interview does not differ from any other face-to-face reference encounter		
(3) During interviews at an information community centre, users are often referred to experts		
(4) The questions asked while interviewing users from a research project are fairly simple in nature		
(5) During instructional interviews, the reference worker has to explain the steps to be followed carefully.		

4.8 SOURCES CONSULTED

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4.9 ANSWERS TO EXERCISES

EXERCISE 1

A structured interview has several advantages for the reference worker, such as:

- establishing the exact topic and purpose of a query
- determining which type of source to consult and search tools to use
- establishing whether particular reference sources are available in the reference section
- saving time by planning the search carefully
- creating an image of an efficient and, thus, credible reference service

EXERCISE 2

(1) empathy
(2) paraphrasing
(3) counselling
(4) roving

EXERCISE 3

(1) True
(2) False
(3) True
(4) False
(5) True

STUDY UNIT

5

SEARCH STRATEGY

A search strategy refers to the systematic planning and execution of a search intended to locate information in the most efficient manner to meet the information needs of an enquirer.



Figure 5.1

Searching for information
(**Source:** Unisa Library)

5.1 INTRODUCTION

In this study unit we introduce you to the purpose of the search strategy, the consecutive steps in the search strategy and what each step entails. You will also learn about the different types of search strategies that can be performed under different circumstances. You will be made aware that different search techniques and skills are required when conducting manual or online searches.

LEARNING OUTCOMES

After you have worked through this study unit you should be able to:

- to explain what the search strategy entails
- understand why a search strategy is necessary
- distinguish between the different types of search strategies
- be aware of the different search techniques for manual, online and internet searches

KEY CONCEPTS

Access points: A name, term or code under which you can search for an information source and identify it.

Entries: Words or terms listed in an index.

Keywords: Natural language terms that represent topics to be searched.

Navigating the internet: To search for information on the internet in a relatively structured manner by using search tools such as search engines, and by applying search skills and experience.

Subject headings: A word or group of words indicating the topic genre/form of an information source.

Surfing the internet: Searching for information on the internet, by following the menu-driven options. Surfing is less structured than navigating.

5.2 PURPOSE AND NATURE OF THE SEARCH STRATEGY

In study unit 1 you have learnt that the reference process comprises two subprocesses, namely the interview (fully covered in study unit 4) and the search strategy. After conducting a reference interview, the reference worker has to plan how he/she is going to meet the enquirer's information need by executing a search strategy. In this study unit we will, therefore, focus on the second sub-process which is the search strategy.

In information retrieval, a search strategy is the systematic plan for conducting a search for information in an information system. The search strategy involves systematic planning and execution of a search so as to locate information in the most efficient manner in order to satisfy the enquirer's information needs.

The concept of a search strategy developed from the need to access information among the masses of sources and resources in an orderly manner. Information is, of course, not arranged according to a prescribed pattern in these sources. Furthermore, information can present itself in many guises the reference worker needs to be familiar with. All of this can have an impact on the planning of a search strategy and it is not surprising that many searchers agree that the entire search strategy cannot be planned in advance.

Purpose of the search strategy

The purpose of the search strategy is to find the most efficient way of accessing information wherever it may be and in so doing, save both the reference worker and the user time and effort. There are a number of routine activities that can be performed to streamline the search process. There are also a number of cognitive processes that take place while the reference worker interviews the enquirer. These will help in deciding on a number of appropriate sources to consult instead of the reference worker taking shortcuts, which at the end can waste the time of both the reference worker and the enquirer

Main steps of the search strategy

In the search strategy, the reference worker has to (1) formulate a clear and concise topic statement which summarises the information needed. The next step is to (2) identify the main concepts in the topic. Then the (3) most appropriate tools for finding the topic must be identified and located. Depending on the complexity of the query and the information tools at hand, it may be necessary (4) to consult lists of authorised subject heading(s) and descriptors in the appropriate indexing systems in order to find preferred terms that represent the main concepts. In online information retrieval, keywords can be combined using Boolean logic to form one or more queries expressed in a manner that is acceptable to the catalogues, bibliographic databases and search engines most likely to contain information on the subject. The search statement should be (5) modified if the initial results of a search are unsatisfactory – there can be either too few or too many results. You can modify the search statement by using synonyms, adding related terms or substituting broader terms to expand retrieval, or by substituting narrower terms to restrict retrieval. Thus, the search strategy evolves until the information need is satisfied.

Features of the search strategy

Two outstanding features of the search strategy are that it is intertwined with the reference interview process and that it comprises both **cognitive and physical activities.** Therefore, the search process can follow two different, sometimes simultaneous paths. The one concerns the reference worker's thought processes and the second one concerns the actual steps followed to locate the information (Katz 1997:179).

Continuous evaluation

A third outstanding feature of the search strategy is the **amount of evaluation** involved. The reference worker is constantly determining which approach should be followed, whether the source or information will be relevant to solve the problem in the stated question. As the search progresses the reference worker needs to weigh the results of the search against the set requirements agreed on during the query negotiation step of the reference interview. Evaluation continues almost throughout the search process.

Planning an effective search strategy requires a sound knowledge of reference sources and the principles of bibliographic control, an understanding of information retrieval systems and the use of technical and information skills, good insight and creative thinking. You have been introduced to these in AIS1501.

5.3 PLANNING THE SEARCH STRATEGY

As already indicated, the search strategy is intertwined with the reference interview. The planning of the search starts as a cognitive process as early as the query negotiation stage during the interview process. However, we can identify a number of steps related to the search process.

In order to plan a search strategy, two things are prerequisite: you need to have a clarified enquiry which should be obtained through a reference interview and you need to have a sound knowledge of the bibliographic tools at your disposal. Remember what you have learnt about the former in study unit 4 of this module and the latter in Module AIS2601.

Manual search strategy

In a manual search strategy, you need to think about the relevant indexes, abstracts, bibliographies and catalogues. These tools are usually categorised by access point, that is, author list, subject list, title list, and so forth. Thus, if the user indicates he/she requires information by a specific author in the reference interview, then your search strategy starts with thinking about author indexes, author catalogues, and so forth. However, you also have to keep in mind that indexes are usually selective, for example, in the journals included or subjects included. The main point here is that you start thinking of the most appropriate and likely place to look to give you high precision.

Online search strategy

Likewise, to plan or create a suitable online search strategy, you need to understand the structure of a database. Database structure tells you the kinds of information available in each information source and how this information is stored on the database. For example, each bibliographic record consists of different fields such as author, title, source, and year of publication. When planning to search the database, you may decide to look only in the title field. Other times, you may choose to use a keyword strategy, which can be entered in specific fields such as the abstract of an article, title field, or the descriptor's field. Keywords can be combined in different ways to retrieve relevant search results.

There are various models representing the consecutive steps in the search process. The value of such a model is that it helps the reference worker to carry out the search more systematically and save both the enquirer and the reference worker time and effort. The search strategy can also be used for personal searches as introduced in INS1501.

The first models that emerged related mainly to manual searches involving printed reference sources. One of the best known is that of Jahoda and Braunagel, which comprises a number of consecutive steps. This model or variations of it is still widely used. The more recent models are more attuned to online searches. In study unit 6 and 7 on online and Internet search techniques, we will revisit the strategies for online and internet searches respectively.

Let's now examine more closely the relevant steps you will need to take in order to create a search strategy.

5.4 STEPS IN THE SEARCH STRATEGY

Since the search strategy forms the **second sub-process** of the reference process, it cannot be carried out without the knowledge gained through the reference interview. The two processes are interdependent. Planning the search strategy is already present in the analysis of the query during

the reference interview. To a large extent, the two processes are integrally entwined as will be discussed below. The reference worker uses the questions he/she has asked during the reference interview to support the planning of the search strategy. At this stage, let's mainly concentrate on the cognitive process which we describe in a framework of consecutive steps.

5.4.1 Analyse the query

During the reference interview the reference worker analyses the query by establishing what information the enquirer has given and what information he/she wants. These are called the given and wanted elements of the query. The wanted element reflects the enquirer's needs which can be categorised under purpose, amount, format, time, language, scope, etc – all these are established during query negotiation in the reference interview.

5.4.2 Identify reference resources

The information obtained from the enquirer during the first step enables the reference worker to decide what kind of reference source should be consulted. For example: for an enquiry about the address of a Johannesburg-based company, the reference worker familiar with reference sources will quickly decide to consult a ready-reference source such as a directory. For an enquiry about silk worms as pets, the reference worker will decide on a catalogue, index or bibliography to determine the title of a book or article that may cover the topic. You have been introduced to the different kinds of reference sources in Module AIS1503.

It is in the planning stage of the search strategy you will have to put the knowledge into practice. Knowledge of these resources enables the reference worker to determine the tools necessary for accessing the information. In some cases a printed tool can be identified. In other cases an online tool such as an OPAC, databases or the Internet will be identified as the best place to look. For example, the website of the said company will most certainly give its address and phone number and, hence, a quick search on the internet may be what is needed.

5.4.3 Identify titles

After the reference worker has determined what category of reference resource to consult, the next step is to decide on a specific title that may be available in the local library. To return to the examples above: in the enquiry about the address of a Johannesburg company, the name, Johannesburg already limits the choice of directories to a particular area. The title of the website of the company would be in the name of the company. Another obvious choice would be a commercial directory for the Johannesburg area, or even the yellow pages of the local telephone directory. Once he/she has decided on an appropriate title, the reference worker is ready to start the actual search, beginning with the translation of the query.

5.4.4 Translate the query

Once the specific title of a reference source has been identified, the reference worker will consult the entries in the reference source to see if they match the keywords at hand – thus translate the

query into the **correct** words. Keywords for tracing information in reference sources are identified during the reference interview when the topic of the query is determined. These keywords serve as access points.

Access language

Information is usually arranged in reference sources according to subject, under subject headings, which serve as the access language of the particular reference source. The terminology used in the subject headings is predetermined by the compilers of the reference source and may not be the same as the keywords of a particular enquiry; although it may have the same meaning. For example, the keyword of the query may be house while the access point of the reference source is either home or residence. Therefore, the reference worker will have to know about using synonyms when searching the entries in a reference source.

Once you have found the correct access point in the index of a reference source, you will be referred to the page where you will find the actual information; or where you will find details of the source carrying the needed information. If your reference source is a library catalogue, you may be referred to the place on the shelves where the information source is kept. Information sources, such as books, are usually arranged or systematised on the shelves according to subject classes. The reference worker, therefore, also needs to know about classification numbers, and how they are used as **addresses** in call numbers of books, since the access language also comprises classification numbers. You learn about classification in Module AIS2601.

If the reference source refers you to a journal article that might have the information you are looking for, you need to know how to locate the article in the journal collection of the library. Journals (also referred to as periodicals or serial publications) are housed as a separate collection arranged alphabetically according to the titles of the journals. In order to locate the article in a journal, the reference worker needs to know how to interpret the bibliographic description of the particular article. Once again you will need to apply your knowledge of descriptive cataloguing gained in Module AIS2601.

In order to translate the query successfully, the reference worker also needs to know how the different reference sources are compiled as introduced in Module AIS1503. For example, all the topics covered in an encyclopaedia are listed alphabetically as are the entries of items in the library catalogue and the subject entries in the index of a book. However, statistical reference sources may follow a numerical arrangement of entries. Whatever the case, the reference worker needs to be familiar with the composition of the different reference sources. It, therefore, becomes evident that what you have learned in isolation in the different modules will need to be applied in practical situations in reference work. This is where creative thinking on the part of the trained information worker comes into play.

5.4.5 Actual search

Conducting the actual search entails a variety of activities and is actually intertwined with cognitive activities carried out during the translation of the query.

Change of direction

As the search progresses, the reference worker, furthermore, discovers further clues to terms that can be followed up. It is then up to him/her to decide whether the search should be extended

(broadened) or scaled down (narrowed) to specific aspects of the subject. At this stage it might be necessary to select more or less specific subject headings or keywords. The reference worker might even decide to find more appropriate terms.

Continuing evaluation

If the enquirer is present during these search activities, he/she should take part in deciding which direction is to be followed. In the enquirer's absence, the reference worker will search according to the decisions taken during the reference interview. The reference worker has to judge the relevance of the data gathered in relation to the specific question posed by the user. The actual search is an ongoing evaluation process where the reference worker constantly needs to weigh the located information against the requirements stipulated during the query negotiation step.

Consult various sources

If the actual search turns up too little material, the reference worker must decide in what order to search other sources. If nothing can be found, the reference worker must decide whether to try new or modified approaches, give up, or suggest other resources (ie other libraries or interlibrary loans) to the user. In any case, the reference worker must determine how much more time can be given to answering the question.

Types of approaches

There are two types of approaches that can be followed for actual searches, that is the (1) specific-to-general approach and the (2) general-to-specific approach. The specific-to-general approach is defined as a search in which the searcher has a known relevant item or topic in mind and wishes to find others similar to it, for example, the enquirer who knows the title of a book on volcanoes, but would like to find out if the library has more books on the topic. In this case subject headings can be examined and then used to locate additional items (books) on the topic.

The **general-to-specific** approach involves searching for information in a reference source that provides a logical overview or map of concepts and vocabulary of a particular topic area. Since items are indexed to the most specific aspects of a topic, it is crucial to determine the correct level of specificity. This can be done by scanning a thesaurus of a particular index such as medical subject headings (MeSH). According to an example given by Dalrymple (1995:75–76), for instance, this index provides terms for the leg bones in the human body. The four bone terms listed are: femur, fibula, patella, and tibia. Articles dealing with fractures of any of these will be indexed at the most specific level. The best way of determining the level of specificity is to consult the thesaurus.

5.4.6 Evaluate the information

After all the possible leads have been followed up, the reference worker will have to determine whether the results of the actual search answer the question. The information located may not all be equally appropriate; or some of the located information may be incomplete. The reference worker may also have accessed information that exists elsewhere but cannot be delivered immediately; or is available in a format inaccessible to the enquirer (such as a foreign language or on a fiche that needs a reader to make it accessible). When evaluating the information, the results of the query negotiation step of the reference interview are invaluable, because they serve as criteria against which the located information can be weighed to determine whether it complies with the set requirements. The reference worker should be actively involved when the set requirements are checked and discussed with the enquirer. This includes the following:

- **Amount of information required:** Is the retrieved information enough or more than enough for the particular task? This has to be determined between the reference worker and the enquirer.
- **Variety of sources:** Has the search yield a variety of sources from which the enquirer can choose?
- **Clarity:** When the information obtained comprises a number of citations, the reference worker should ensure that the enquirer understands how to use or interpret them; and know how to look for books and journals in which the information may appear.
- **Location:** The reference worker should direct the enquirer to the physical location of the information sources or make arrangements for obtaining them if not available in the library's holdings.

5.4.7 Present the answer

When the reference worker is satisfied that the located information complies with the requirements set during the negotiation process, it can be presented to and discussed with the enquirer. Pending the outcome of the presentation, it may be agreed that:

- the information may be insufficient
- information that is available elsewhere should be requested through interlending, or purchased
- the search should be extended
- the search should take a completely new direction
- the located information is not what the enquirer had in mind

You will notice that the enquirer is most actively involved in the first and last steps of the search strategy when there is dialogue between the enquirer and the reference worker. Although the enquirer may also be involved in the other steps of the search strategy, these steps entail mainly thinking and searching activities carried out by the reference worker.

In theory these are the steps of a search strategy. However, the search process is not always this neat. In practice, the selected reference source may not provide the required information. The reference worker may decide on an alternative source only to discover that it has gone missing from the collection, or he/she may access the information in a remote location, but be physically unable to deliver it to the enquirer. It could also be that once the information item has been located, the content coverage proves to be far too broad for the user.

All the above is proof that the search strategy is not a process that can be planned in its entirety before being implemented. The steps above show that the first part has to be executed before the next step can be taken. However, a major part of the search strategy is devised while the search is in progress. Whatever the case, the reference worker should be in control and take professional decisions to ensure the user of his/her commitment to reference work.

5.5 EXAMPLE OF A SEARCH STRATEGY

In the previous section we have covered the consecutive steps of a search process. These are actually the basic principles to be followed in all kinds of searches, whether manual or online. However, to demonstrate a manual search we will use a practical example of a request received at a public library. In this particular case, the visual part of the search process starts when the enquirer approaches the reference worker with a request.

5.5.1 Identify the topic

The first step is to clarify the topic. In this case the reference worker has learned that the enquirer is looking for books on caring for budgies. The interview revealed the topic, enabling the reference worker to formulate the keywords 'birds' and 'pets'. The enquirer's statement of his query also informs the reference worker about the form in which the information is required, namely a book.

5.5.2 Select the type of reference source

The next step is to decide on the type of reference source to consult. In a manual search, the option is a reference work that covers the topic. The keywords need to be matched with the subject headings used by the reference source. In an online search, you will start with the library catalogue or select a relevant database such as the OCLC's WorldCat database which contains millions of online records. In an internet search, a Google search with the phrase 'caring for budgies' is quite acceptable, especially if the information required is not necessarily of an academic nature.

5.5.3 Narrow or broaden the search

Call number

The term "birds" is rather broad and covers information on pets as well as wild birds. Therefore, the original search needs to be narrowed to birds as pets. This search once again reveals a number of options including cage birds, canaries, cockatiels and so forth. These options enable the reference worker to narrow the search even further until he/she is satisfied with a specific term. In a library, a search under the selected term in the catalogue will reveal the records of a number of books available in the library. The entry in the catalogue provides a classification number representing the subject, which, in this particular case, is 636.68. This classification number is assigned to the relevant book with the first three letters of the author's names added to the classification number to show where it stands on the shelves, and is referred to as a call number. For example: a book by Peter Smith on budgies would have the call number 636.68 SMI.

In an online search, the results of the relevant books or sources will be listed, usually chronologically beginning with the latest. The first list usually gives brief information but is often linked to more detailed information. Thus, a 'click' on the item leads to a fuller citation or to an abstract of the source document. If the tool being used is an OPAC, details of the library, the call number and the availability will be indicated. If the tool being used is a database, there will be an indication as to whether or not a full-text version is available and how to obtain it either by a free link, by subscription or by purchasing it. The same applies to the internet.

5.5.4 Locate the book or source

With this information at hand, the reference worker can go to the shelves to locate the particular book on budgies. Perusal of the book will indicate whether it contains the information required.

If not, the books adjacent to it may offer the required information and can be taken to the enquirer for consultation.

5.5.5 Searching an encyclopaedia

Apart from the information in the library's book collection, a reference source such as an encyclopaedia may also have some information relevant to the query. Information in reference sources is usually arranged alphabetically according to topics. Depending on the particular title, either the encyclopaedia or its alphabetical index can be consulted. If the index is consulted, cross references may guide the searcher to the required term in the index or directly to the pages in the encyclopaedia where the information occurs. Remember that some encyclopaedias are now in electronic format and can, therefore, be accessed online.

5.5.6 Searching an article

Provide an answer

Another option is to consult an indexing journal to find out if anything on budgies has been published in a periodical. A citation (bibliographic description) of the periodical that carries the information will appear in the index. Instead of providing the actual information, the reference worker will provide the citation(s) as a search result. In this case, the reference worker will discuss the citation with the enquirer to make sure that the information on it is understood and that the enquirer knows how to go about locating the periodical. If the library has a copy, the reference worker will take the enquirer to the shelves to obtain the copy and arrange for photocopies if necessary. If the periodical is not available in the collection, arrangements can be made to borrow it from another library, or to order it from the publishers. If the periodical is electronic, it may be possible to download or print a copy for the user. All these options should be discussed with the enquirer who will have the final say.

Nowadays, most libraries have online catalogues to which the same search procedure applies, except that most of the search is done automatically. You will learn more about online catalogues in study unit 7.

5.6 CONCLUSION

Search strategy's role in the reference process

In this study unit you have been introduced to the search strategy and its role in the reference process. You have also learned that the search strategy cannot be planned without applying the knowledge gained from other modules at second-year level on bibliographic control tools and reference sources. This is why it is so important that you understand the purpose of bibliographic control and how it supports the actual search process in reference work.

You have also learned that creative thinking and different skills are required in conducting different types of searches. Many of the skills required for database and online searches; and searches on the internet are covered in more detail in the third and fourth-year modules. However, you need to know how they are applied in reference work. This issue will be dealt with in the following study units.

5.7 REFLECTION EXERCISES

EXERCISE 1

Look at the following description and describe how the information guides you to find this article in the journal collection of a library that subscribes to the particular journal Joswick, KE & Stierman, JP. 1993. Systematic reference weeding: a workable model. *Collection Management* 18(1):103–115.

EXERCISE 2

Complete the following statement by choosing (a), (b), (c) or (d) below:

Comparing keywords of a query with subject headings is known as ... .

(a) searching for information
(b) creative thinking

(c) translating the query
(d) presentation of information

EXERCISE 3

Considering an actual search, what do you think the purpose of the following is?

(a) the page numbers to entries in a book's index
(b) the call number in a catalogue entry
(c) a cross reference in a book's index

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5.8 SOURCES CONSULTED

Caswell, JV & Wynstra, JD. 2010. Improving the search experience: federated search and the library gateway. *Library Hi Tech* 28(3):391–401.

Collard, S & Whatley, K. 2011. Virtual reference/query log pairs: a window onto user need. *Reference Services Review* 39(1):151–166.

Dalrymple, PW. 1995. Bibliographic control, organization of information and search strategies, in *Reference and information services: an introduction*, 2nd edition, edited by RE Bopp & LC Smith. Englewood, Colo: Libraries Unlimited:55–83.

Katz, WA. 1997. *Introduction to reference work*. Vol II: Reference services and reference processes. 7th edition. New York: McGraw-Hill.

Moody, MK. 1991. Document search strategies and general reference search strategies: an analysis and comparison. *The Reference Librarian* (32):57–69.

Smith, AG. 2012. Internet search tactics. *Online Information Review* 36(1):7–20.

5.9 ANSWERS TO EXERCISES

EXERCISE 1

In order to find an article in a journal collection, you need the following prior knowledge about the storage of journals in a library collection:

- Journals are arranged alphabetically according to titles.
- The volumes of the journal are arranged numerically in each title.
- The quarterly issues are arranged numerically in each volume.
- Each issue has a table of contents indicating each article's page numbers.

In order to locate the article mentioned above, you need to go to the journal collection and find the title of the journal under C for Collection Management. Once you have found the journal concerned, you look for the required volume number, in this instance volume 18. Go to the first issue in the volume (which is usually bound). The next step is to consult page 103 to 115 of the issue to find the article written by Joswick and Stierman. The final step is to scan the article quickly to establish whether it really has the information you are looking for.

EXERCISE 2

(a) Translating the query

EXERCISE 3

(a) To guide the searcher to the place in the book where information on the entry can be found.
(b) To guide the searcher to the place on the shelf in the library where the book covering the topic in question can be found.
(c) To guide the searcher to another entry in the index that may have a similar meaning.

STUDY UNIT

6

Online database searching

Online searching is an information retrieval procedure where the majority of routine activities such as matching keywords of the query with descriptors of the database are carried out by a computer program. Several techniques can be applied to refine the search action in order to limit the search results to only relevant material.



Figure 6.1

Research Commons
(**Source:** Unisa library)

6.1 INTRODUCTION

You have already learned the basics of searching for information using computers and the internet in Module AIS1601. In this study unit we will introduce you to online search techniques in reference works and illustrate how these techniques differ from the traditional manual searching techniques. You will learn about the search interview, the search strategy, various search features, the steps in a basic search and how to process the accessed items. You will also learn how to decide which search methods you will use to find information (eg a manual search, online databases or the internet).

LEARNING OUTCOMES

After you have worked through this study unit you should be able to

- explain how a search using electronic methods differs from a search based only on manual methods
- apply the different online searching techniques appropriately
- explain the role of controlled vocabulary in online searching
- explain how to select suitable electronic resources to search (eg databases)
- select and use suitable electronic tools to answer reference queries
- explain how you would process the online search results (eg adding value, printing, downloading)

KEY CONCEPTS

Basic command language: Predetermined instructions that have to be used in online searching.

Boolean logic: Method of combining terms in searches for online systems by using the Boolean operators OR, AND and NOT.

Controlled vocabulary: A list of subject headings or descriptors assigned by a database service or an index service to be used by searchers.

Descriptors: Selected terms used on databases and indexes to represent the contents of a document.

Downloading: Capturing search results on a computer disk (computer hard drive, external hard disk, flash drive or CD) for off-line printing at a later stage.

Expand command: An instruction used in online searching that allows you to view a portion of a display of an index.

Precision: An evaluative measure used to define the proportion of documents retrieved in a given search that are relevant. In information retrieval, precision is a measure of search effectiveness, expressed as the ratio of relevant records or documents retrieved from a database to the total number retrieved in response to the query. For example, on a database containing 100 records that are relevant to the topic "book

history", a search retrieving 50 records, 25 of which are relevant to the topic, would have 50% precision (ODLIS 2006).

Proximity operators: Techniques used in an online search to specify relationships between words (eg the number of words that may come between two or more words or the word order).

Recall: An evaluative measure defined as the proportion of relevant documents on a database that are retrieved by a particular search.

Stop words: Words in a phrase that cannot be searched online, for example: as, in, the, by, and, with.

Truncation: A technique used to search for alternatives of a search term by using only word characters that form the stem of the word, for example, librar? The question mark (?) is often used as the truncation operator.

6.2 ONLINE SEARCHING

Electronic searching is the process of matching search terms (keywords) from the query with suitable descriptors from the database using a computer program. When searching online, the computer that is used for searching is connected to the internet or intranet rather than a stand-alone computer.

Electronic searching

In the previous study unit, we have provided you with examples of manual and electronic search strategies.

Online searching, however, takes precedence over manual searching as most databases are available online nowadays. Therefore, you will need to know how to conduct electronic searches. These searches involve online searching of databases and the internet. However, since information on the internet is not controlled, searching internet resources differs from searching databases. Searching the internet will, therefore, be dealt with in the next study unit.

Assessment tools

From the other second-year AIS modules you have learned how bibliographic control tools are created and what an important role they play in accessing information. These tools are developed according to standardised codes, which, in a sense, are prescriptive, but enhance the effective retrieval of information that is publicly available. Originally these bibliographic control tools – catalogues, bibliographies, indexing journals and abstracts – were compiled and published as hard copies. As information proliferated and technology improved these access tools were made available in electronic format, allowing access to a larger number of information items at high speed.

Select search tools

You will recall that in the previous study unit we have explained the steps in the search strategy, which included the identification of reference resources to be used. You need to decide whether to use an in-house database such as the library catalogue, commercial database, or the internet. The decision depends on what is available and what can provide the best results.

Remember that when a user comes to you with a request, you will first go through the basic steps and procedures of the interview as explained in study unit 4. Only once you have gathered sufficient information on the information need, will you be able to decide on a suitable search method. If electronic searching seems appropriate, you will follow the steps and principles in this study unit.

Relevant information

Due to the rapid growth of available information, it is impractical and impossible to retrieve all information on the given query and it is time-consuming to sift through the information without limiting it to certain parameters to find the most relevant information. Therefore, a need has emerged for techniques to access only what is relevant for a particular request. The need for accessing more precise information (precision) resulted in the development of techniques that refine the search and deal with features of natural language such as synonyms and changes in terminology over time.

The rest of this study unit is devoted to the steps to be taken and the different techniques that can be applied during online searching.

6.3 ONLINE DATABASE SEARCH TOOLS AND TECHNIQUES

The main tool in online searching is the computer software and interfaces. The technology has developed to such a high level that we are able to manipulate electronic information resources to find the most relevant information for a specific purpose.

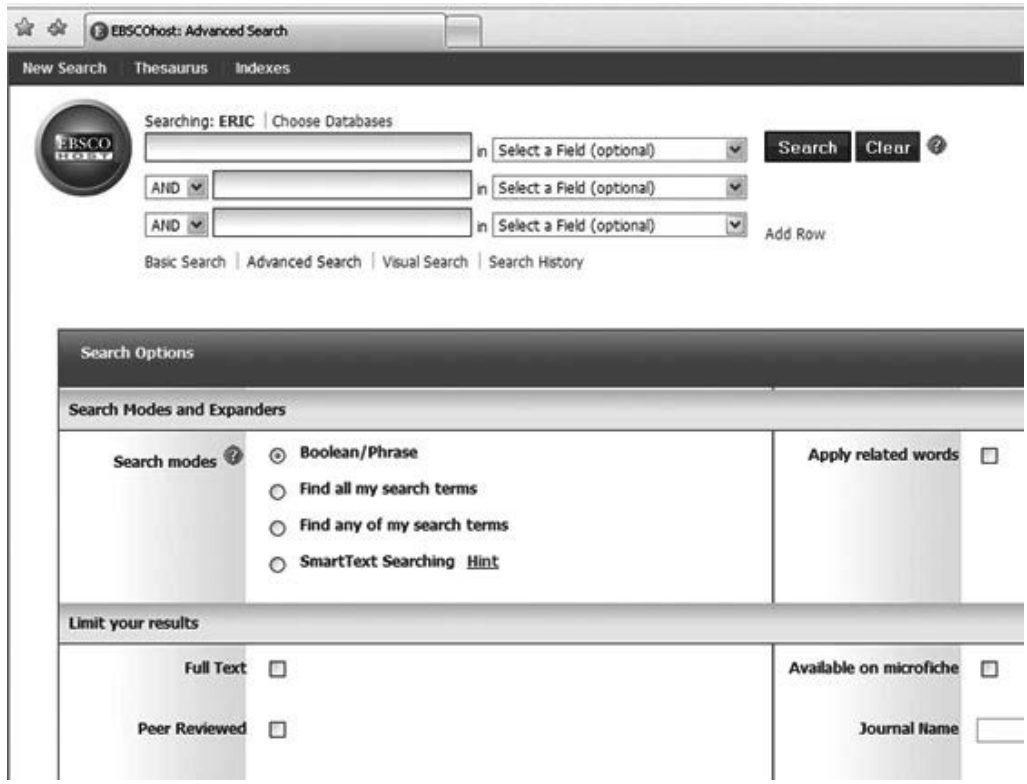
Originally databases had to be searched using very specific command language words. The rapid growth of the internet and the development of user-friendly searching on the internet impacted on formal databases; and vendors designed easy-to-use interfaces. This means that a basic command language is not used often nowadays. It is, however, good to know about it as one might encounter some of the commands. We have discussed interfaces in study unit 3.

Start a search

Before starting a search, the searcher analyses the query to find out exactly what the enquirer is looking for and in what format the answers are desired. The first step is to examine the query and determine the major concepts involved. After the concepts have been identified, the searcher (reference worker) starts generating possible search terms that could be used to find documents about the concepts in the query.

Select search terms

Sources of terms include the searcher's own knowledge of the subject, familiarity with the database and printed indexes in the field, or just common sense (Walker & Janes 1999:38). Many databases have a thesaurus and/or an index that can be used.



http://0-web.ebscohost.com.oasis.unisa.ac.za/ehost/search/advanced?sid=d1266338-95f2-44da-92f1-9490c6864030%40sessionmgr111&vid=1&hid=118

Figure 6.2

Example of search interface with Thesaurus and Index search options

Database seldom stands alone and forms part of the collection of a specific database vendor, such as Emerald, EBSCO or ProQuest. Each database or database vendor provides its own interface. Some examples can be seen in fig. 6.2 in the **Search options** block and the **limit your results** block.

There are techniques and devices that enable a searcher to retrieve the most relevant information from a database. The most fundamental techniques involve the use of Boolean logic, controlled vocabulary and field searching. We shall now explain these and other techniques.

In the following example we assume that the searcher generates these terms in cooperation with the enquirer and with the use of a thesaurus.

Example of a query: alcohol use and abuse

Terms: alcohol abuse, alcohol use, alcohol intoxication, alcohol

When using the Dialog databases to search for information using the terms given above, the command used to search for a given term is SELECT. Therefore, the next step is to type in the SELECT command followed by the search terms to describe your topic, for example alcohol use or alcohol abuse.

SELECT retrieves records containing the specified search term and stores them as numbered sets. A set is the group of records retrieved. The set number, for example, S1 can be used later in SELECT commands to represent the search terms it contains. In our example, ALCOHOL ABUSE

is the first set (ie S1). The result is displayed on your computer screen showing the number of records retrieved that contain the term ALCOHOL ABUSE as S1.

Each succeeding set you select will be numbered S2, S3 and so forth. The results can be displayed as indicated below:

S1 196 ALCOHOL ABUSE
S2 493 ALCOHOL USE

Boolean operators AND, OR, and NOT may be used in SELECT statements to join two or more terms. When this is done, set numbers may be used instead of terms, for example:

?S1 196 or alcohol use
S3 689 alcohol abuse or alcohol use
(S3 shows the matches – the result of this search)
?S5 145 and drugs
S6 100 Alcohol abuse and drugs
(S6 shows the number of matches – result of the search)

After a set is retrieved in response to a search statement, its contents may be viewed to determine the specific documents it contains. The DIALOG command to display records in a set is TYPE, which can be abbreviated as T. The format of the type command is TYPE n/f/b–e, where n is the set number to be displayed, f is the number of the format to be used, b is the number of the first document and e is the number of the last document to be displayed. An example is given below.

67917 BRAIN (1967)
11676 HEAD
15436 TRAUMA?
15539 INJUR?
S2 8103 (BRAIN OR HEAD) AND (TRAUMA? OR INJUR?)

```
?s (brain or head) and (trauma? Or injur?)
67917                BRAIN (1967)
11676                HEAD
15436                TRAUMA?
15539                INJUR?
S2    8103 (BRAIN OR HEAD) AND (TRAUMA? OR INJUR?)
```

Figure 6.3

Example of a TYPE command

Remember that each database or database vendor provides the basic command language or interface. As you continue to work with diverse databases and vendors, you quickly learn to adapt to the variations. The variations may even include a combination of the three types of interfaces, thus allowing both novice and expert searchers to find information in the databases. In addition to the basic command language, there are techniques and devices that enable a searcher to retrieve the most relevant information from a database. The majority of fundamental techniques involve the use of Boolean logic, controlled vocabulary and field searching. We shall now explain these and other techniques.

6.3.1 Boolean operators

Boolean logic is a set of techniques used in mathematics to manipulate sets in a rigorous, logical fashion (Walker & Janes 1999:32). They provide three ways (operators) in which sets can be combined, and online systems use all three to manipulate search terms. Boolean operators allow the searcher to manipulate and combine these sets to provide the user with a set that corresponds with the logic of the initial query. The Boolean operators we are referring to are OR, AND and NOT (or AND NOT).

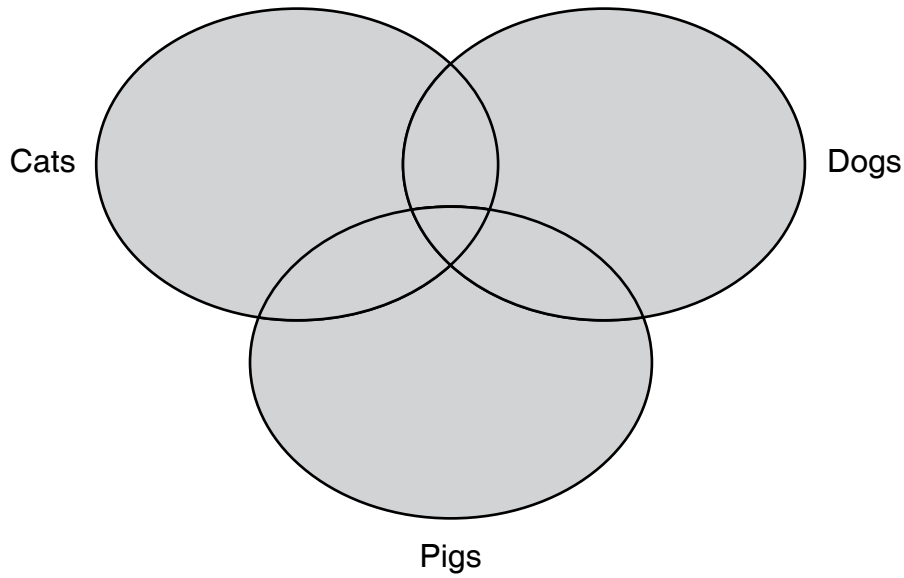


Figure 6.4

Broadening the search

The **OR** operator is used primarily to widen a search and capture information from all concepts that are represented in the search terms. For example, if you search for 'dogs' OR 'cats', you are in effect asking the system to retrieve all records that contain the word 'dogs' as well as all records that contain the word 'cats'. Your records will include either the one (dogs) OR the other (cats) OR both. Your results will have many records including those that contain both words. OR is used to enlarge the sets, and to retrieve more documents. The OR operator is important when (i) the concept being searched has many terms that are synonymous or near synonyms (eg rivers, streams, brooks), (ii) the search term has different spellings and/or derivatives (eg encyclopaedia and encyclopedia, encyclopedic), (iii) searching a database that does not require controlled vocabulary, and (iv) multiple concepts are being searched (eg cats and dogs).

The OR operator helps you to search for terms that are very close in meaning, but slightly different in spelling such as 'cows' and 'cow', 'dogs' and 'dog, behaviour' and 'behavior', to ensure that you do not miss retrieving a record just because of the difference in spelling or the word used.

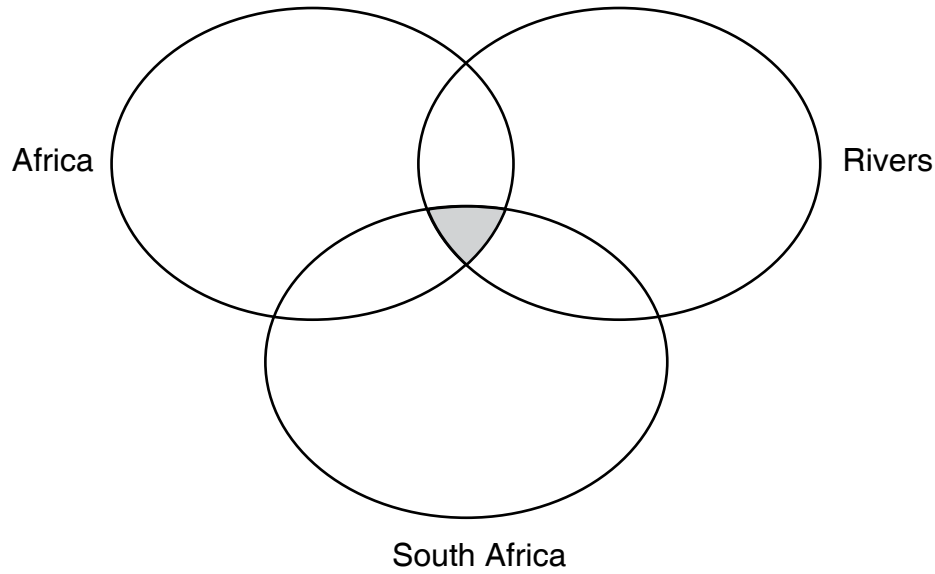


Figure 6.5
Narrowing the search

The **AND** operator is used in online searching to make a connection between two concepts or terms. For example, a search for 'dogs' AND 'cats' will retrieve only those records that contain both terms. If a record deals only with the concept/term "dogs" but does not have anything to do with 'cats', it will not be retrieved in the search. Similarly, the records that contain 'cats' but do not contain 'dogs' at the same time will not be retrieved. 'AND' is used to produce a set that is smaller, because it carries the condition that both concepts/terms must be present. The AND operator is useful when refining a search for better precision. Thus, if we want to find information about the rivers of South Africa, we should search for 'rivers' AND 'South Africa'

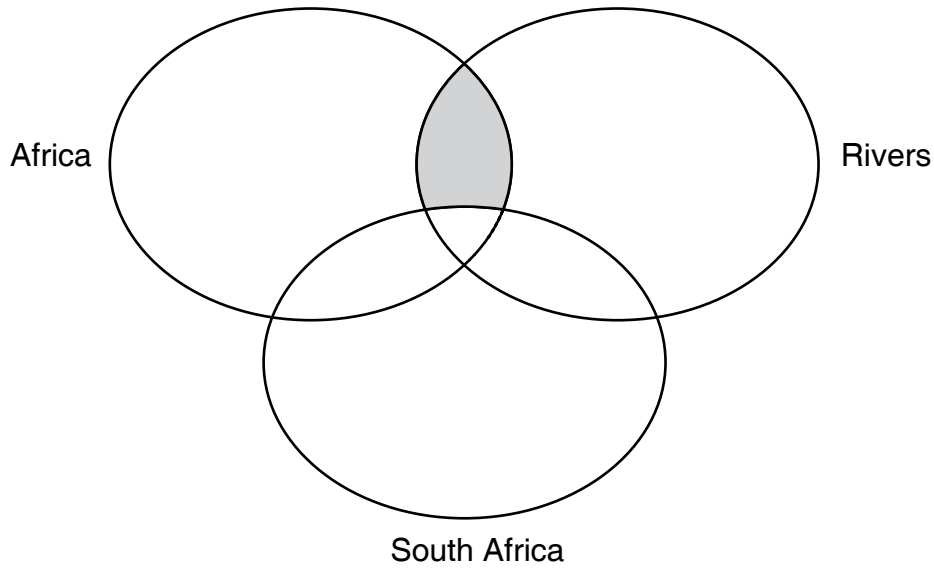


Figure 6.6
Refining a search to exclude

AND NOT or simply **NOT** is the third Boolean operator. NOT is used to exclude items that contain a certain term or terms from a set. For example, in the set of dogs and cats an item was found (that refers to farm animals) that is irrelevant to the query about dogs and cats as pets. In order to exclude the items on farm animals, a set is developed on this concept and NOT is used to exclude it from the required result.

The diagram below show how Boolean operators are used.

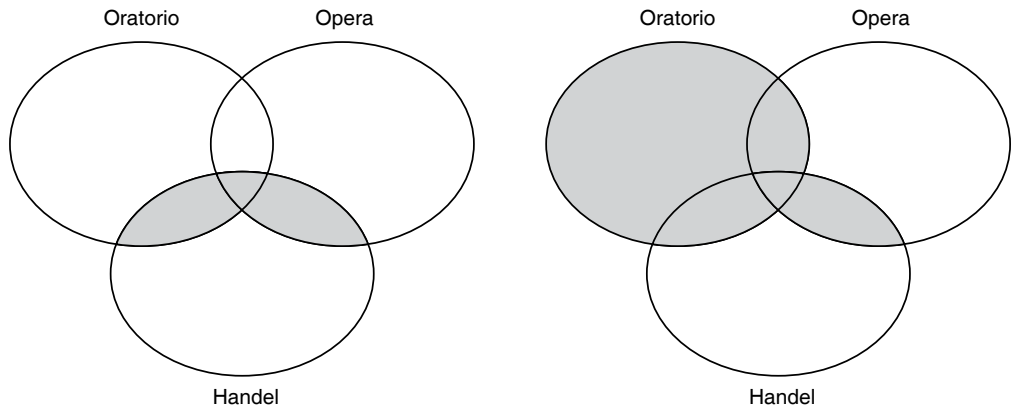


Figure 6.7

Use of Boolean operators

The Boolean operators enable a searcher to define and refine the relationship between concepts and/or terms by combination. These combinations can be as simple as the examples above or more intricate. For instance, one can search for 'rivers' OR 'lakes' AND 'Africa' NOT 'South Africa'.

6.3.2 Controlled vocabulary

Predetermined search terms

As you already know by now, in online searching it is a computer program that does the actual matching of keywords from the query with suitable descriptors from the database. Natural language poses a problem for such electronic searches due to the infinite variety of words and the many relationships in which they can appear. Unless some control is prescribed by a database, an online search will provide access to an incredible number of documents, the contents of which may be irrelevant to what the enquirer had in mind. Therefore, controlled vocabulary is actually a sifting device comprising lists of subject terms database producers use for indexing the documents in their files. Searchers can consult these lists which are known as controlled vocabularies or thesauri. These thesauri contain not only synonyms, but also relationships between terms and aids to help select the best terms to search for a given concept.

Relationships between terms

Relationships between terms are indicated by using, for example, broader terms (BT), narrower terms (NT), related terms (RT), recommended terms (UF) and forbidden terms (U). Forbidden terms may not be used for search terms. These indicators actually instruct the searcher on how to go about structuring a command. An entry for **information scientists** may have the following instruction:

Information Scientists: UF Information brokers
Information professionals
Information specialists

Here UF, which stands for Use For, indicates that "information scientists" is the preferred term and that the other three listed are not to be used. Thus, if you try to search the database for the term "information brokers" you are not likely to find any records, because the preferred term is "information scientists".

Another instruction under the same entry reads:

Information Scientists: NT Librarian

This means that "librarian" is a narrower term than "information scientists". If a document is strictly about librarians it will be indexed using that term. Thus, it is for the searcher to decide what kind of specificity is required for a particular search.

Advantages

Using these thesauri can be a big help in planning searches. You do not need to search under every possible synonym for a search term. Many databases also have online versions of controlled vocabularies you can consult while conducting searches. For example, in DIALOG we can access the online thesaurus by using the EXPAND command, as shown in the example below.

```
                    E (for more EXPAND)
The following is the result:
?p
        Ref Items Index-term
        E13 1 BIASING EFFECTS
        E14 1 BIASNESS
        E15 3 BIATHLON
        E16 1 BIAZHUN
        E17 20 BIB
        E18 10 BIBB
        E19 1 BIBB COUNTY INSTRUCTIONAL MATERIALS CENTER GA
        E20 1 BIBBIDIBOBBIDIBOO
        E21 1 BIBBINS
        E22 1 BIBBITS
        E23 1 BIBCON
        E24 2 BIBDATA
```

Figure 6.8

Example of an EXPAND display

Controlled vocabulary can be a very powerful tool. When it works, it can produce high quality results and give you the confidence that you have found most of the good documents on a database. Another technique, namely free-text searching, can be used. This is where you make use of the proximity operators we discussed earlier. There can, however, be some disadvantages.

Disadvantages

- Recently coined terms, including new topics and jargon, may not yet be included in the list of subject terms.
- When a database does not provide a thesaurus or list of subject terms, the controlled vocabulary may not be obvious.
- Most recent articles will not show up in your results if they have not been indexed yet.
- The strength of the searching by subject headings is taken away from you when you combine databases of similar subjects if these databases do not use the same thesaurus.

6.3.3 Field searching

In field searching, the search is restricted to a particular field on the database (eg the author field or the title field). This means that when searching for, say, George Fox as an author, the software checks only through the author field and can only retrieve records with the term "fox" as the name of a person. Note that if the search term "George Fox" is executed without restriction, the results will include the subject word fox which may include foxes as animals as well as biographical information on someone by the name of Fox, thus retrieving false drops. Field searching is valuable because it focuses your search and makes it more efficient.

The most common fields include title, author, date (year/s of publication), subject, descriptors, keywords, language and source type (eg book e-book, DVD, journal).

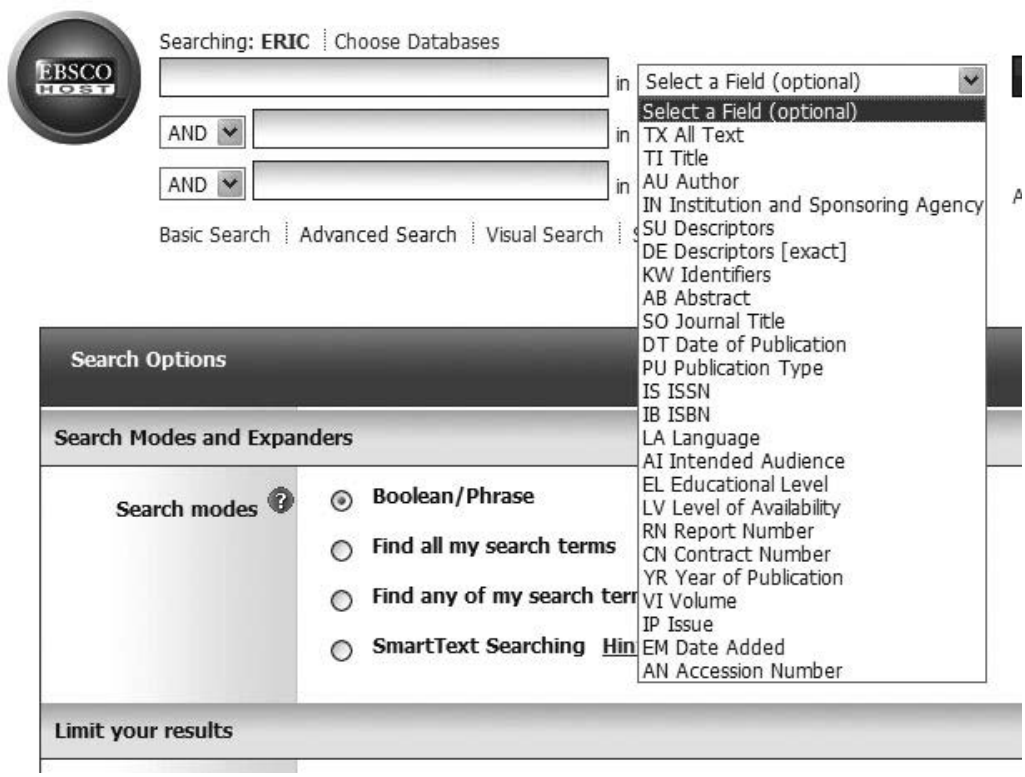


Figure 6.9

Selections in the dropdown menu (EBSCO – ERIC database screen)

For example, the Unisa OPAC (library catalogue) for keyword searching provides the following screen:

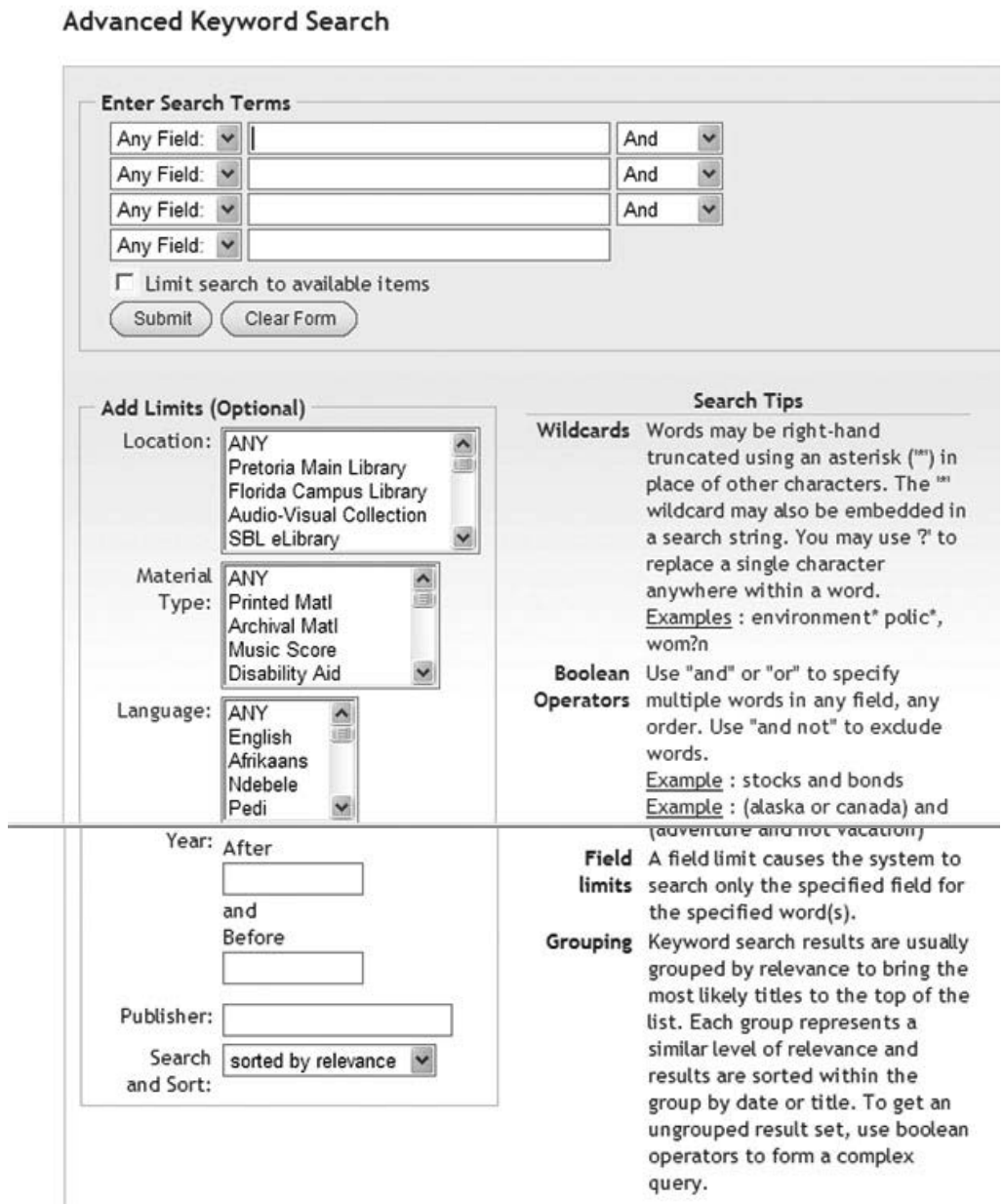


Figure 6.10

Example of field searching options and other search delimiters in the Unisa Library OPAC

Where you see a down arrow (eg Search and Sort), there is a drop-down menu with further options.

6.3.4 Other techniques and devices

As you continue practising online searching, you will discover that a lot of information retrieved is not always relevant. Sometimes there is high recall but low precision, that is, many records are retrieved but very few of them are relevant to the query. Other times, there are **false drops**, or records which have nothing to do with the query (eg information about foxes when the query was for biographical information about someone whose name is Fox). These challenges can be dealt with by using devices that enable you to refine the search.

Refine searching

Techniques such as basic command languages and menu-driven systems, controlled vocabulary and field searching were devised to help us to refine searching effectively for information in electronic format. Reference workers need to know what role each of these techniques play and how to apply them in order to access information effectively or instruct end users how to conduct online searches. There are additional devices such as truncation, proximity, stop words and limiting by scope of information (eg abstract, full text) that offer considerable help in refining the search.

6.3.4.1 Truncation

Truncate means to drop characters and add a symbol at the end, beginning, or within a search term in order to retrieve records represented by variants of the search term. Truncation is particularly useful in retrieving the **singular** and **plural** forms of a word in the same search. For example, *library is a truncation that makes it possible for the system to retrieve records containing “interlibrary”, “intralibrary”, “librarian”, “librariana”, “librarianship”, “libraries”, “library” and so forth. On most online databases, the end truncation symbol is the * (asterisk). However, the truncation symbol is not standardised, hence, other symbols may be used (?, $, #, +). The truncation operator used by DIALOG is the question mark (?), which can be used in several ways. The most common is to search for alternatives such as LIBRARY, LIBRARIES, LIBRARIAN and LIBRARIANSHIP. For these your search statement will be “librar?” which will direct the system to look for all documents containing words that begin with the characters “librar”. These will be collected in a single set by “OR” ing them together.

.As a general rule, it is unwise to truncate fewer than four characters. For example, “art*” retrieves “artist”, “artistic”, “artistry”, and “artwork” but also “artichoke”, “artillery” and so forth. Some databases are designed to truncate automatically. You are advised to read any help screens carefully before truncating on an unfamiliar database.

Left truncation
Middle truncation

Truncation can also be used to indicate that all the words ending with the indicated characters should be retrieved. This is known as **left truncation**, for example, “?mycin” will retrieve records with words such as “actomycin”, “antimycin”, “biomycin” and “erythromycin”. **Middle truncation** is used to indicate the beginning and the end characters of a search term, for example, “wom?n” will retrieve information on both woman and women. Middle truncation is used specifically to provide for spelling variations.

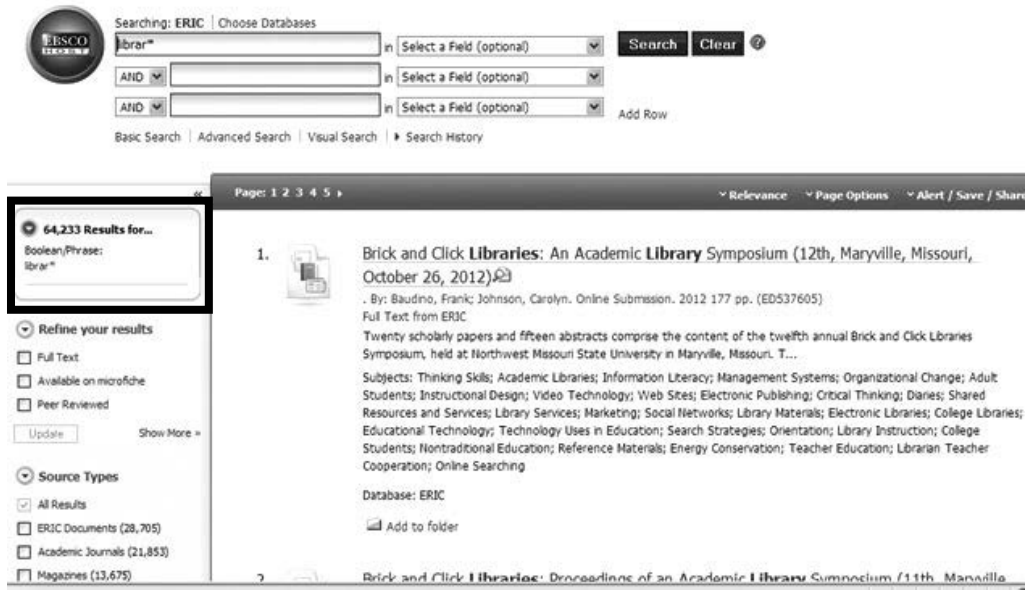


Figure 6.11

Truncation librar* (EBSCO – ERIC database screen)

Truncation is a very useful device to ensure that as much relevant information as possible will be retrieved. However, it should be used with great care, because it may result in the retrieval of information irrelevant to a query – see fig 6.11 above.

6.3.4.2 Proximity operators

Specify relationships

Proximity operators allow you to state how close to each other the search terms should be for a match. This is especially helpful when searching for concepts that need to be closely related. For example, when searching for information on a person named "George Felix Fox", the search term "George" should be not more than two words away from the term "fox"; otherwise you will retrieve documents with the sentence "George was not present for the fox hunt". With the **(N)** or **(near) operator**, proximity searching enables you to be specific. For example, "George N2 fox" means that for the record to be retrieved, the two terms must appear within two words of each other. The (N) operator specifies that terms must be adjacent to each other, but can be in any order, for example: SELECT RETRIEVAL (N) EFFECTIVE? This statement will also retrieve information on effective retrieval.

The **(W)** or **(with)** operator specifies that terms must be adjacent to each other and in the order specified. A number added to the (W) operator specifies the number of stop words that have to be replaced, for example: SELECT GEORGE (2W)FOX for George Felix Fox, or GONE(2W)WIND for Gone with the Wind.

Index search terms that are intact phrases such as descriptors and identifiers, are often included both as individual words and full phrases. Some systems specify that phrases have to be put in parentheses (eg "University of South Africa") to enable a search to find documents with the exact string of words. However, proximity operators allow us to specify relationships between concepts. They are used to specify how close you wish two or more words to be in the documents that are retrieved (Walker & Janes 1999:80).

6.3.4.3 Stop words

Stop words are those little words most databases do not index. Usually, stop words would not represent a searchable concept on their own. The most common stop words include: a, an, the, on are, so, with, where, how, this, there, it, my, he, she, and so forth. You can imagine that there are many such words in a database. There is no standard list of stop words that all databases adhere to (Bell 2006) and for every database that you search you will, therefore, need to find out if there is such a list so that you can eliminate them from your search terms. These lists can usually be found in the help section of every database.

6.3.4.4 Limiting by scope of source (eg full text)

It is possible to state that you only need to retrieve records that lead to a full-text electronic document. This is to ensure that you get the entire document rather than just a citation or abstract. Database vendors, therefore, add value to their databases by indicating which of the records are linked to full text; and by allowing you to restrict your search to such records. See figure 6.2 and 6.9.

6.3.4.5 Pearl growing

Pearl growing is a useful search strategy. It involves doing a simple search first, with the intention of achieving high recall and examining the results to find appropriate subject headings or discover further terms to search (Bell 2006).

6.4 ONLINE DATABASE SEARCH STRATEGY

The reference process for online searching begins with a user whose information need can be best satisfied with an online database search. The search might be requested by the user; or the need for an online search could be identified during a traditional reference interview.

Steps in the search activities: clarify; select databases; actual search; post-search interview; processing

The steps the reference worker takes to help the user find the required materials are known as the search strategy. As in the case of a manual search, it is important to conduct a search interview to clarify the enquiry and how it can be best served by electronic methods for information searching. This is followed by selecting a suitable source or sources (eg a database or databases). Then the actual search is carried out, followed up by post-search negotiation and eventually downloading or processing of located items. (Processing includes sorting, value addition, printing, etc.) These steps will be discussed in the next few sections.

6.4.1 Search interview

Establish search strategy

During the search interview, the reference worker guides the user with fairly structured questions to determine the parameters within which the online search should be conducted. This is mainly

to decide on the types of databases to search. At the same time, the reference worker informs the user about the capabilities and limitations of an online search. Typical questions are asked and their purpose is illustrated below:

- Is the search part of research needed to write an assignment, article, bid for a contract, business report, dissertation or for personal interest? This will determine the overall framework for the search.
- Is it essential that as much information as possible about the topic should be gathered. This will allow the reference worker to decide whether to access one or more databases to meet the particular information need.
- Should the search cover more recent material or is currentness not as important as breadth of coverage? The reason for this question is that current information may be available on specific databases while other databases may be chosen for their range of coverage.
- Is a particular type of literature critical to the research? Databases often cover a particular type of literature such as dissertations, newspapers or government reports which can be essential to the search.
- Is the language of the material important to the user? Sometimes language requirements play an important role in database selection and manipulation.
- Are there geographical requirements? Material from or about another country can be an important factor to consider.
- What level of specialisation is required? Material for undergraduate students would probably need to be less specialised than that for a researcher specialising in a subfield of a particular subject.
- Is it a one-off search or one of a series of searches on the same topic? Some searches may be constructed differently if they from part of a series of searches with an opportunity for evaluation and refinement between sessions. For example, in evaluating the search results the user may indicate how the search should be adapted by selecting highly relevant records or keywords from these records to improve the search.
- What time constraints apply to delivery of the information? Depending on the answer, different output modes need to be considered such as a direct printout while the user waits for a printout mailed to the user at a later stage or mostly the results are emailed to the user.

Below is an example of how to formulate reference queries for an online search.

Question	Answer	Response of searcher
Why do you need the information?	For an article	Decide on type of database
How much information do you need?	As much as possible	Use more than one database to which the library subscribes (eg ERIC, Library Literature and LISA) or search within a database group, eg EBSCO
Is it essential for you to have the most recent information?	Yes	Search on the online databases to make sure that the most recent information is covered

Is a particular type of literature critical to the research?	No	If the answer is yes, select a database that covers the type of literature, for example theses
Is the language of the material important to the user?	Yes, only documents in English are required	Limit the search to documents published in English
Are there geographical requirements?	No	If the answer is yes, limit the search according to geographical location
What level of specialisation is required?	None	Not all databases offer options to specify a field of specialisation. Eric, for example, includes a field for an intended audience where one can, for example, specify that the documents should be aimed at teachers, practitioners, and so forth. See fig 6.12 below
Is this a one-off search or one of a series of searches on the same topic?	A one-off search	If a search is part of a series, allow for evaluation and refinement between sessions
What time constraints apply to delivering the information?	Results are required immediately	Print a copy of the results

Clarify topic

During the search interview there is continual dialogue between the user and the reference worker. As the dialogue progresses the topic of the query becomes more and more refined until the reference worker can decide which Boolean operators to apply. The use of Boolean operators is virtually synonymous with online searching.

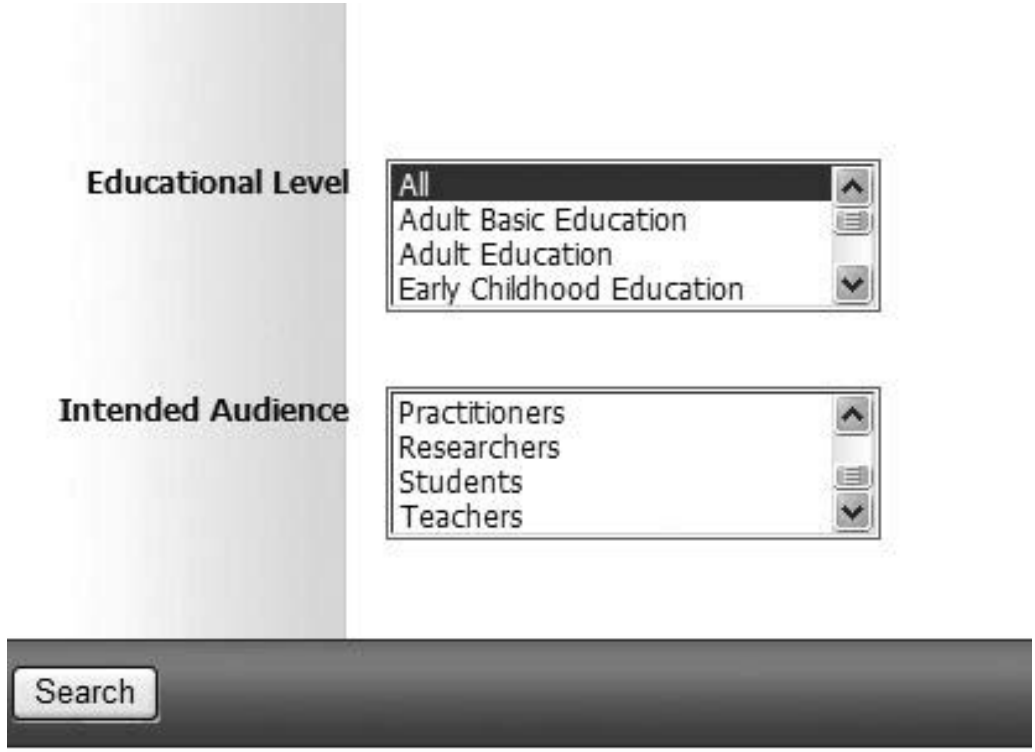


Figure 6.12

Intended audience (EBSCO – ERIC database screen)

6.4.2 Database selection

Database guides

After the search topic has been clarified, the reference worker, as searcher, needs to identify and select the database(s) that will provide the most effective results. The first point of call is usually the OPAC which is an electronic database of all the materials in the library. The external databases, usually accessed through database vendors, are mostly also found via the library homepage. The vendors such as ProQuest, EBSCO, and so forth provide guides to their databases that help determine the appropriateness of a database. These guides typically have detailed descriptions of the subject coverage. The reference worker would review these descriptions to see whether the search topic is among the primary subject areas or whether it falls into a more peripheral area. You will learn about these guides in more detail in the third-level modules. Generally, there are certain criteria you should bear in mind when selecting a database. These include:

- Subjects covered.
- Kinds of entities included (eg periodical articles, books, reports, patents and theses).
- Focus of the entities (eg popular or academic in nature).
- Period covered by the entities included. Many journals are being digitised retrospectively and can go back as far as the first volume even if it is in the 1800s.
- Selection policy, which has to do with the entities included for indexing.
- Quality of the entities included (eg being selective in the choice of suitable entities).
- Origin (ie the part of the world from which the literature comes).

Matching keywords

When selecting a particular database, it is useful to examine the thesaurus of the database (if available) to find out if it will be necessary to use any keywords of the search topic or whether controlled vocabulary is necessary – the descriptors used in the thesaurus. A thesaurus can be in printed or is in online format. An absence of parallel or synonymous terms suggests some incompatibilities between the topic and the database. Usually the reference worker and the user identify the descriptors they think come closest to the search concepts.

Figure 6.13 is an example of an entry for the search term INFORMATION SCIENTISTS from the ERIC thesaurus.

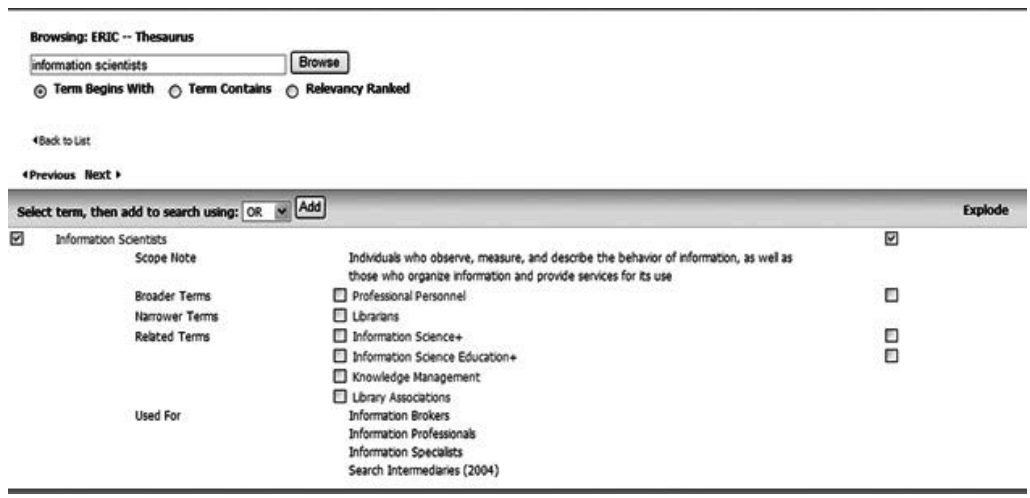


Figure 6.13

Entry from ERIC thesaurus (EBSCO – ERIC database screen)

6.4.3 Actual search

Applying techniques

After selecting the appropriate database(s) and consulting the thesaurus/thesauri, the reference worker is ready to carry out the search. Often the user who requested the search will be present and will receive running commentary (and perhaps instruction if required) as the search progresses. The actual search involves the refinement or minor modifications to the search strategy. It is during these sessions that the various techniques and devices we referred to in 6.3 above are applied as considered necessary.

Negative outcomes

If the search sessions have immediate outcomes that differ markedly from those planned, it is an indication that the matches were not as intended and the search should be stopped and redesigned with new information taken into account.

Search strategy

The formulation of a search strategy is essential for a successful online search. It serves as a guideline for planning a search and enables the searcher to decide on the various tactics to apply. The basic principles include the following:

- analysing the request and identifying the most important concepts
- determining search terms
- using truncation
- combining concepts and search terms with the aid of Boolean operators
- using parenthesis
- refining search strategies and proposing alternative search strategies

While doing the search, the reference worker continuously evaluates the search result and adapts the search accordingly. Once he/she is satisfied with the search results, they can be sorted (eg according to journal title or author), printed, downloaded or e-mailed. Below is an example of a search result from the Dialog database.

5/8/1
DIALOG (R) File 11: (c) 1998 Amer. Psychological Assn. All rts. reserv.
01532776 1998±07266±014
Parent training.
SERIES TITLE: The LEA series in personality and clinical psychology.
DESCRIPTORS: *Behavior Modification; *Daily Activities; *Disorders; *Parent Child Relations; *Parent Training; Adults; Children; Developmental Disabilities; Head Injuries; Schizophrenia
IDENTIFIERS: planned activities parent training behavioral technique, children and adults with normal intelligence or developmental disabilities or head injuries or schizophrenia or other disorders
SUBJECT CODES AND HEADINGS: 3200 (Psychological and Physical Disorders); 3312 (Behavior Therapy and Behavior Modification)

Figure 6.14
Example of an online search result

6.4.4 Downloading

Most searches have one or more outputs as an end result. The output comprises citations of information sources or full-text articles or book chapters. The output can be offered as an offline printout or it can be downloaded electronically on the searcher's computer disk (flash memory, external hard disk, CD, etc).

The reference worker who conducted the search can also add some value first by sorting all the selected items in some or other order. This can range from having the output sorted according to some useful criterion such as the title of the source journal, or adding the library's call number to citations on the printout. This is necessary for the user to have a full understanding of the printout and its use.

6.4.5 Post-search follow-up

Explain citations

Usually the results of a search consist of citations of journal articles, books, or other forms of literature. When these results are presented to the user, the reference worker needs to help the user to process these citations. In Module AIS2601 you have learned how the citations of various information sources are compiled. You apply the newly acquired knowledge when you have to explain the salient parts of the citation; and the identification of the citations of different kinds of information sources. The user needs to be told which steps to follow to obtain the required material, either from the shelves of the host library or from the information service by accessing the full-text material and downloading it, through the interlibrary loan service or by ordering it from the publishers.

In the post-search follow-up the reference worker should make sure that the user is satisfied with the service offered and knows how to move on from this point.

6.5 CONCLUSION

In this study unit we have explained the techniques and process of online searching to you. At first, it may seem difficult and slow, but regular practise leads to expertise and enhanced efficiency. Keep in mind that the online search procedure was not covered in detail here; since there are many related processes that will be introduced in more advanced AIS modules at third year level. However, you have learned that for online searching, a search strategy similar to the one for manual searching is planned, although it is adapted for the online environment.

You have also learned that in online searching, the computer does the searching that a person does in manual searching. The discussion of the various techniques should provide an indication of how sophisticated the search languages are and that online searches can be conducted effectively by using controlled vocabulary. The main driving force behind all the search techniques and aids is to obtain only the most relevant items to meet the information need of the users as captured in the initial search query. This is after all what reference work is all about.

In the next study unit we will discuss how to search the internet for reference purposes, and also consider how internet searching differs from conventional online searching.

6.6 REFLECTION EXERCISES

EXERCISE 1

Below are four excerpts from databases covering different subject fields or different forms of information sources. Study them carefully. Select a database for each topic in the block below which you think will provide appropriate information and indicate the reason for your choice.

ERIC (DIALOG)
ERIC: Educational Resources Information (DataStar)
DIALOG: 1, CD-ROM; Practice File: 201 =
DataStar: ERIC

Coverage: 1966 to date
Updates: Monthly
Alerts: DIALOG/DataStar Alert services available
Data Type: Bibliographic
Providers: U.S. Department of Education, Office of Educational Research and Improvement (OERI), Educational Resources Information Center; Washington, DC, U.S.A.; and ERIC Research and Processing Facility; Laurel, MD, U.S.A.

ERIC is the complete database on educational materials from the Educational Resources Information Center. It covers the entire range of education literature, from pre-school to higher and adult education. ERIC also includes such areas as handicapped and gifted children; tests, measurement, and evaluation; counseling; educational management; teacher education; educational facilities; and more.

The database corresponds to two print indexes: *Resources in Education* (RIE), which is concerned with identifying the most significant and timely education research reports; and *Current Index to Journals in Education* (CIJE), an index of more than 700 periodicals of interest to every segment of the education profession. Many items can be purchased from the ERIC Document Reproduction Service in paper copy or microfiche.

DIALINDEX Categories —
1: EDUCAT, INFOSCI, LANGUAGE, PSYCH, SOCSCI
201: ONTAPS, SOCTAPS

CROS Group: 83

EURO-SELECT: Public Support Schemes in Europe
DataStar: ESEN, ESFR

LISA (Library and Information Science Abstracts)
DIALOG: 61

Coverage: 1969 to date
Updates: Monthly
Alerts: DIALOG Alert service available
Data Type: Bibliographic
Provider: Bowker-Saür, Ltd.; East Grinstead, West Sussex, U.K.

LISA provides comprehensive coverage of international materials in the field of library and information science. The database consists of two subfiles: LISA records that cite published works, and Current Research records that correspond to the print *Current Research in Library & Information Science*.

More than 350 journals from 60 countries are screened for inclusion in LISA. Subject coverage is wide-ranging and includes not only librarianship and library services, but also online information retrieval, videotex, electronic publishing, word processing, teleconferencing, information storage and retrieval, and abstracting and indexing services. Also covered are related areas, such as publishing and bookselling, bibliography, archives, non-book materials and associated equipment, education, cultural activities, and mass media.

DIALINDEX Category: INFOSCI

LitAlert®
DIALOG: 670

Coverage: 1970 to date
Updates: Weekly
Alerts: DIALOG Alert service available
Data Type: Bibliographic
Provider: Derwent Information; McLean, VA, U.S.A.

Books in Print®
DIALOG: 470

Coverage:	Current
Updates:	Monthly
Alerts:	DIALOG Alert service available
Data Type:	Directory
Provider:	R.R. Bowker, a Reed Reference Publishing company, a division of Reed Elsevier Inc.; New Providence, NJ, U.S.A.

Books in Print is the definitive source of information on books currently published and in print in the U.S. The database provides the record of forthcoming books, books in print, and books out-of-print or declared indefinitely out-of-stock by their publishers. Scientific, technical, medical, scholarly, and popular works, as well as children's books, are included in the file.

The database corresponds to several print publications: *Books in Print, Subject Guide to Books in Print, Books in Print Supplement, Paperbound Books in Print, Children's Books in Print, Books Out-of-Print, Forthcoming Books, Subject Guide to Forthcoming Books,* and *Books in Series.*

Records in Books In Print include bibliographic citation information (author, title, subject, publisher, and date of publication), as well as International Standard Book Number (ISBN), binding and price, LCCN, LC classification number, and annotations.

Reviews from *Publishers Weekly, Library Journal,* and *School Library Journal* are included since 1983.

DIALINDEX Category: BOOKS

Dissertation Abstracts Online
DIALOG: 35
DataStar: DISS

Coverage:	1861 to date
Updates:	Monthly
Alerts:	DIALOG/DataStar Alert services available
Data Type:	Bibliographic
Provider:	UMI Company; Ann Arbor, MI, U.S.A.

Dissertation Abstracts Online is a definitive subject, title, and author guide to virtually every American dissertation accepted at an accredited institution since 1861, when academic doctoral degrees were first granted in the United States. It is the single most comprehensive source of dissertation information, with more than 1,000 participating institutions.

The database covers more than 1.2 million doctoral dissertations and masters theses. More than 40,000 titles are added each year. All subject areas are covered, but professional and honorary degrees are not included. Citations for thousands of Canadian dissertations, and an increasing number of papers accepted abroad, are included in the database. British and European dissertations are included in the database from January 1988 forward.

Abstracts are included for a large majority of the degrees granted after January 1980. In addition, abstracts are included for *Masters Abstracts* from Spring 1988 to date.

DIALINDEX Categories: HUMANIT, LANGUAGE, PLASTICS, PSYCH, SOCSCI, UMI

CROS Group: 83

Figure 6.15

Excerpts from databases

Topic	Appropriate database	Motivation
(1) Books on computer-aided design		
(2) Training Library and Information Science students as Indexers		
(3) Bill Cosby's doctoral dissertation		
(4) Cataloguing and classification for school media centres		

EXERCISE 2

Indicate which Boolean operators you would use to retrieve records on the following topics:

(1) Library collections in academic libraries
LIBRARY COLLECTIONS ..... ACADEMIC LIBRARIES

(2) User satisfaction with online library catalogues
USER SATISFACTION ..... ONLINE LIBRARY CATALOGUES

(3) Medical libraries or academic libraries
MEDICAL LIBRARIES ..... ACADEMIC LIBRARIES

(4) Guides for library personnel excluding library technicians
LIBRARY PERSONNEL .... LIBRARY TECHNICIANS

(5) Library instruction on online searching in public libraries
LIBRARY INSTRUCTION ..... ONLINE SEARCHING .... PUBLIC LIBRARIES

(6) Training in indexing, abstracting and thesaurus construction
INDEXING ..... ABSTRACTING ..... THESAURUS CONSTRUCTION

6.7 SOURCES CONSULTED

Anuradha, KT, Sivakaminathan, R & Arun Kumar, K. 2011. Open-source tools for enhancing full-text searching of OPACs: Use of Koha, Greenstone and Fedora. *Program: electronic library and information systems* 45(2).

Bell, SS. 2006. *Librarian's guide to online searching.* Westport, Conn: Libraries Unlimited.

Forrester, WH. 2000. *The online searcher's companion*. London: Library Association.

ODLIS. 2006. Online dictionary for library and information Science. By Joan M Rietz. Libraries Unlimited Available at http://lu.com/odlis_e.cfm (accessed on 22 January 2013).

Smith, AG. 2012. Internet search tactics. *Online Information Review* 36(1):7–20.

Walker, G & Janes, J. 1999. *Online retrieval: a dialogue of theory and practice*. 2nd edition. Englewood, Colo: Libraries Unlimited.

Zhitomirsky-Geffet, M, Feitelson, D, Frachtenberg, E & Wiseman, Y. 2009. A unified strategy for search and result representation for an online bibliographical catalogue. *Online Information Review* 33(3):511–536.

6.8 ANSWERS TO EXERCISES

EXERCISE 1

Topic	Appropriate database	Motivation
(1) Books on computer-aided design	Books in Print	Covers books that are currently being published.
(2) Training Library and Information Science students as indexers	Lisa, or Eric	Covers material in the field of Info Sc
(3) Bill Cosby's doctoral dissertation	Dissertations abstracts	Covers dissertations and theses
(4) Cataloguing and classification for school media centres	Eric	Covers educational materials

EXERCISE 2

(1) library collections and academic libraries
(2) user satisfaction and online library catalogues
(3) medical libraries or academic libraries
(4) library personnel not library technicians
(5) library instruction and online searching and public libraries
(6) indexing, abstracting or thesaurus construction

STUDY UNIT

7

SEARCHING THE INTERNET

The internet with all the vast amounts of information has become a vital resource in modern life. Everywhere people are talking of finding information on the internet or advising others to check for information on the internet. On the internet, people expect to find the latest information quickly. The internet and new methods of communication have, therefore, become essential in reference work. In addition to their skills in accessing conventional information sources and sources in electronic format, reference workers also need to be skilled in accessing information on the internet. The nature of the internet demands a different approach requiring different skills in searching for information.



Figure 7.1

Internet searching
(**Source:** Unisa Library)

7.1 INTRODUCTION

You have learnt about internet sources and resources in the level-one modules AIS1503 and AIS1601. If you still have the Only Study Guide for AIS1503, it would be useful to reread section 3.5 and 3.6 to refresh your memory of the World Wide Web and other related resources. In this study unit we are going to introduce you to techniques used for searching the internet for reference work purposes. You will learn how internet searches differ from manual searches and sophisticated, conventional online searches. You will also learn how to plan a search strategy, including the pre-search interview, how to select an appropriate search engine, how to conduct an actual search, the steps that should be taken to translate the query and how to combine search terms, examine results and continue a search. Finally you will be provided with guidelines that should be considered when conducting searches.

Since it is impractical to provide background on the internet as an information resource within the confines of this study guide, we strongly recommend that you also consult chapter 2 in the prescribed textbook for Module AIS1503, namely the third edition of Bibliographic control and information sources by SJ Behrens as well as some of the recommended readings given in Tutorial Letter 101 for this module.

LEARNING OUTCOMES

After you have worked through this study unit, you should be able to:

- distinguish between manual, online and internet searching
- plan a search strategy for an internet search
- explain what a search interview entails
- evaluate search engines for a given search
- apply the search methods offered by different search engines

KEY CONCEPTS

Algorithms: Strategy followed by robots to collect information for indexing.

FAQs: Stands for frequently asked questions. These are lists of questions which are typically asked by newcomers to a newsgroup.

Hyperlinks: Also known as pointers on a web page that enable us to move from one page to another and thereby retrieve information non-sequentially.

Relevance ranking: Refers to the sorting of information found according to its relevance to the query.

Search interface: A point where the user and the system interact. It is usually the greeting screen of the database where menus are used to guide or prompt the searcher to select the required search options.

URL: Uniform Resource Locator. This refers to the address for a website, for example: http://www.unisa.ac.za.

Website: Refers to a collection of web pages representing a particular organisation or a subject. The term "website" is also used to refer to the physical location where documents relating to the site are stored on the computer.

7.2 INTERNET SOLUTIONS TO SEARCHING

Value of internet

The internet provides access to a wealth of information on countless topics contributed by people throughout the world. The information available on the internet continues to proliferate. The network is growing into a multiplicity of sources that are of vital importance not only to the layperson, but also to the scientific community. As a result, there is an increasing need to access information on the internet. The quality of the information on the internet ranges from highly sophisticated and authentic to suspect or simply lies.

Access facilities

Access to highly authentic information has increasingly become a problem, because information on the internet is disorganised and unstructured. Search engines, directories and subject guides have been developed to make it easier to find information on the internet. These tools take over the task of finding and assembling all the information that could be relevant to the search terms. However, because of the nature of the internet, these tools provide higher recall than precision.

User-friendly interfaces

The networked systems were designed with the layperson in mind who knows very little of the sophisticated retrieval tools being used by dedicated searchers. Since the designers wanted ordinary people to use the system, they developed user-friendly interfaces whereby greeting screens give you introductory instructions and lead you by the hand to help you work through the information. Having said all this, we should not forget that search tools for the internet are constantly improving.

In view of the enormous potential of the internet as an information source and efforts to improve access tools, it is imperative that reference workers know how to search effectively for information on the internet in order to serve their respective user groups. Thus, for the purpose of this study unit, we will focus on the operations of available facilities that enhance the accessing of information. These are search engines and subject directories. In this study unit we will focus on their features and abilities to facilitate subject searches.

7.3 SEARCH ENGINES

In this section you will be introduced to the computer programs that are used to conduct effective searches on the internet. We will distinguish between search engines and subject directories since they differ in composition as well as searching methods.

Automatic indexing

Essentially web search engines are software programs designed to search for and retrieve information stored on the internet. The information may be from web pages, images, information and other types of files. Some search engines also mine available data on databases or open directories. However, when you use a particular search engine to find resources on the internet you are not searching the entire internet. You are only searching the subset of the internet that has been identified by the particular search engine. Therefore, you have to keep in mind that search engines can sometimes help find some information, but no search engine can find everything at all times (Brandt 1997:47). It is, therefore, important to learn how to use different search engines and to use more than one search engine if you need to conduct an exhaustive search. Nowadays,

there are many search engines, but the most notable ones for reference work include Google, Bing, Yahoo, Open Directory, Ask (previously AskJeeves) and Gigablast. South African search engines include Ananzi. We will briefly discuss some of these later, but first it is important for you as a reference worker to understand what a search engine entails. You need to know how it is designed and which functions every component performs.

7.3.1 Basic components

A search engine comprises three basic components that are respectively responsible for

- gathering websites to be indexed
- building or compiling the database in which information on the website is stored
- searching the database

7.3.1.1 Component for gathering websites and other sources to be indexed

Index creating

Hyperlinks

Search engines use computer programs to identify, retrieve and locate information on the WWW and sometimes other internet resources. The programs that are used to do the gathering are called “agents”, “crawlers”, “spiders” or “robots”, “robot” being the most popularly used term. These programs automatically collect information to be indexed in the database component of the search engine at set times. It is important to remember that once a query has been typed in and instruction has been given to search, there is no human involvement in the rest of the searching activities. The robots move from one website to another by following the hyperlinks. Words on the websites that serve as hyperlinks are usually coloured differently or underlined. The robots also identify new websites and scrutinise dead links (ie links to sites of documents that are no longer active).

Algorithms

Search engines use different robots with different strategies or instructions to collect information for indexing. These strategies are called algorithms. The strategy used by the robot while searching the web determines the quality of information it accesses and retrieves for its database (Scales & Felt as quoted by Dong & Su 1997:69). For example, Google has a complex network of algorithms based on the popularity and importance of each web document. The popularity factor is determined by the number of links pointing to the site while the importance factor is determined by linkage from other pages.

Indexing

When visiting a website, a search engine requests the web documents from the site. Once it has requested the documents, the robot contacts the search engine and indexing begins. Depending on the search engine’s specific strategy, one, some, or all of the following parts of a document can be indexed:

- URL of the site
- Title of the site

- Main headings
- First paragraph on the first page
- All the text in the document (ie all keywords)
- Meta tags (these are keywords used by the developers of the site to describe the content).
- They are similar to descriptors or indexing terms used in conventional databases.
- Images, videos, sound, and so forth.

An index created in this way then becomes part of the database component of the search engine. This type of index (on the internet) is regarded as a list of indexed words found at the sites visited by the robot with pointers to their locations at various sites. It is important to note that when you are using a search engine, you are not searching the internet 'live' as it exists at the moment of the search. You are rather searching a fixed database that has been compiled at some time prior to your search.

Two types of indexing are distinguished, namely breadth-oriented indexing and depth-oriented indexing.

Breadth-oriented indexing takes place when the search engine indexes all the keywords in a web document. This allows for exhaustive coverage of the content of a web document since all words are indexed. For example, the Ask search engine is able to retrieve queries phrased in natural language. This can however, lead to false 'hits' (also known as false drops) when the search engine is used to search for information.

Depth-oriented indexing takes place when the search engine indexes only the title or main headings of a web document. It allows for very specific indexing which means that when you are searching for a specific word the web documents you retrieve should be relevant, because they contain substantial information on the topic. For example, the Yahoo "content acquisition program" indexes commercial sites; thus introducing an element of authoritativeness.

Considering the above, it is crucial when selecting a search engine to find out how its robot indexes the web documents. The selection of search engines will be discussed later on.

7.3.1.2 Component for compiling the database

Database of websites

The robot that collects information resources records all indexed information on the search engine's database. Together with the indexed information, a database can then include any of the following information from the sites from which the information originates: web address, titles of the websites, web documents or other resources, first lines, abstracts, the size of the website, or even the full text. This information can then be displayed when retrieving the hits for a search.

7.3.1.3 Component for searching the database

Information sorting

A search engine also has a component for searching a database, called an agent, as well as features and options for searching. An agent is software that can operate autonomously and look for relevant information (Chen, Chung & Ramsey 1998:605). After a searcher has submitted a query,

the search component, or agent, will search the database and display a sorted list of hits. Hits are the websites, web documents, web pages or other information resources found. The list of hits is normally sorted in order of their relevance to the query. Among items of the same relevance, the most popular sites are listed first. Sorting information according to their relevance is called **relevance ranking** and is based on the relevance rating of the information resources.

Search engines differ in their formulas for working out the relevance rating of information resource to a query. This can be very confusing for users of a search engine, especially since search engines do not provide sufficient detail on this matter. As mentioned above (see algorithms), not only do search engines go about their task in different ways, they sometimes produce amazingly different results. Other factors that influence results include the size of the database, the frequency of updating and the search capabilities. Search engines also differ in their search speed, the design of the search interface, the way in which they display results and the amount of help they offer.

7.3.2 Notable examples of search engines

There are countless search engines available on the internet and the number continues to grow. Some search engines like Lycos, appear, disappear and reappear. Some are bought by bigger franchises: Alta Vista, for instance, was bought by Overture which, in turn, has subsequently been bought by Yahoo. Infoseek was renamed GO.com after being bought by Disney and was eventually turned into a portal for Disney press releases (McDermott 2006:7). Nevertheless, some giants have emerged.

7.3.2.1 Google (www.google.com)

Google has a simple interface that allows novices to search the internet, but has a complex algorithm that provides high precision. With the most unlikely search terms, a searcher is able to retrieve surprisingly relevant hits. For example, half-remembered words from a poem, title or text will lead to the right information source. Further developments have included tools for expert searching through its "advanced searching" features. There is also Google Scholar (scholar.google.com) for searching scholarly literature such as peer-reviewed papers, theses, books, abstracts and articles from academic publishers, professional societies, pre-printed repositories, universities and other scholarly organisations, and Google South Africa (www.google.co.za) which is offered in English, Afrikaans, IsiZulu, Sesotho and IsiXhosa for searching South African websites.

Developed by doctoral students at Stanford University who wanted to analyse links on web pages, Google has many features and a myriad of "tricks" for finding relevant information.

Google Earth provides three-dimensional imagery of any part of the world complete with the fun of virtually "flying" there. Google's local search (http://local.google/lochp) is used in Canada, the USA and the UK to point out businesses in the local area of the searcher, including a map, directions or satellite view to the selected business. For reference work, Google can also now "search a version of the OCLC union catalogue called Open WorldCat for books held in OCLC libraries near you" (McDermot 2006:9). Google has become such a force that its name is used as a verb – I have Googled the subject.

7.3.2.2 Yahoo (www.yahoo.com)

Yahoo was the first www search engine and has bought a number of smaller search engines and combined them into a formidable engine. When using this engine for reference work, it is advisable to use the URL http://search.yahoo.com, which does not have all the news items, advertisements and all sorts of hyperlinks that are found on the main site. Yahoo has antispyware which helps to block pop-ups and other unwanted streams. Like Google, Yahoo also allows librarians to search OCLC's (Open WorldCat) version to find books and advise on the nearest location.

7.3.2.3 Open Directory (http://dmoz.org)

Open Directory is a large human-edited internet directory cum engine, the main advantage of which is the relevance of the results. The command language is menu-driven. The Open Directory was founded in the spirit of the Open Source movement, and is the only major directory that is 100% free. It is costless, and there are also no costs attached to submitting a site to the directory and/or to use the directory's data. The Open Directory data is made available for free to anyone who agrees to comply with its free use license (dmoz open directory project, 2007).

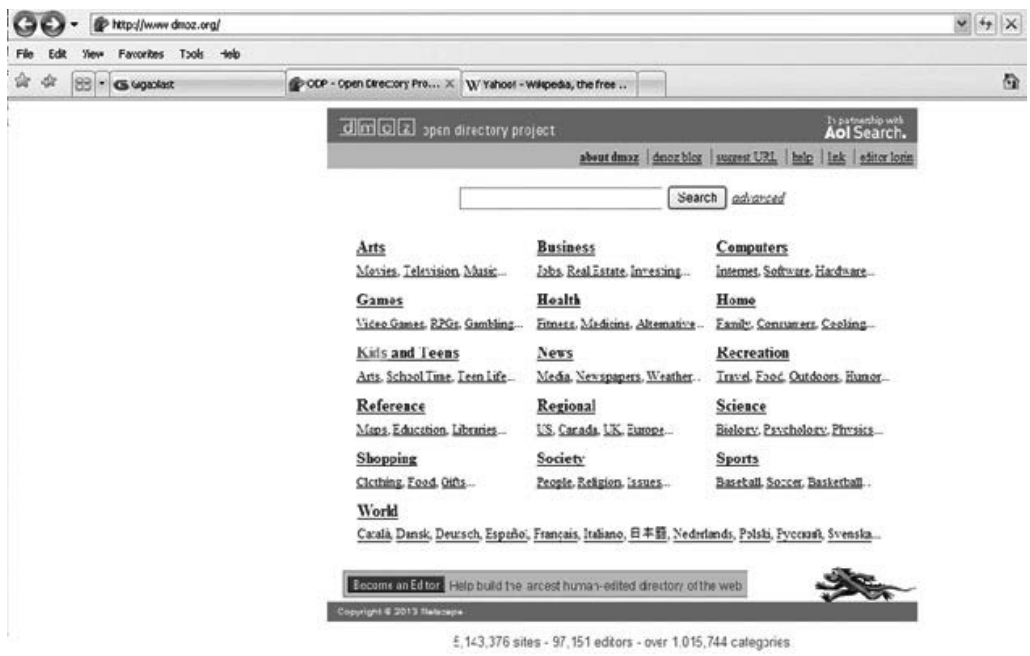


Figure 7.2

Main categories of the Open directory

7.3.2.4 Bing (www.bing.com)

In June 2009 Microsoft's rebranded search engine, Bing, was launched. Microsoft calls it a "Decision Engine", because it's designed to return search results in a format that organises answers to attend to your needs. When you search on Bing, in addition to providing relevant search results, the search engine also shows a list of related searches on the left-hand side of the search engine results page (SERP).

Bing launched with several features that are unique in the search market. For example, when you mouse-over a Bing result a small pop-up provides additional information for the result, including a contact e-mail address if available. The main search box features suggestions as you type and Bing's travel search is touted as being the best on the net.

7.3.2.5 Ananzi (http://www.ananzi.co.za)

The Ananzi search engine is devoted to South African websites. Ananzi currently indexes over 2 300 000 web pages related to South Africa, some of which do not end in .za, but in .com or .net instead. On Ananzi, sites are individually checked to ensure that the search engine stays South African. First created in early 1996, as the first South African search engine, it is said to be one of the fastest search engines on the internet. Alongside the search engine, Ananzi's SA Site Directory is a hand-picked category-based list of the best sites South Africa has to offer. Thus, Ananzi consists of two sections: the SA Site Directory and the Search Engine (SA Web). In order to get your site into the Ananzi search engine, you first have to submit it to the SA Site Directory from where it is spidered (indexed) and added to the search engine if it meets the acceptance criteria. The command language is menu-driven but there is also a search box for keying in specific search commands (Ananzi 2013).

7.4 META SEARCH ENGINES

Since there is not much of an overlap between the coverage of the different search engines, meta search engines were developed to search several search engines at the same time. Dogpile (www.dogpile.com), Ixquick (www.ixquick.com) and Mamma MetaCrawler (www.mamma.com) and Kart00.com (www.kartoo.com) are examples of metasearch engines. There is, however, no meta search engine that searches all search engines at the same time. Each meta search engine has different methods of searching and covers a different database of resources (search engines). The search engines create the database and the meta search engines then provide access to a selection of search engines. When using a meta search engine, it is necessary to type in the search query once.



Figure 7.3

Meta search engine Dogpile

Meta search engines normally use one of the following methods for searching:

- a single search form to search all the search engines simultaneously
- individual search forms for each search engine allowing the user to search one search engine at a time

Meta search engines can be used effectively if you:

- understand the different search protocols and search syntax (ie how the individual search engines operate and allow you to search for information)
- want to do a quick, single-word search
- are looking for rather unique terms

Dogpile (www.dogpile.com) searches Google, Yahoo!, Index, and others and retrieves web pages, multimedia files and images. Results are categorised per search engine. Dogpilemeta search engine has an advanced feature that enables you to apply Boolean logic.

Ixquick (www.ixquick.com) is said to be a sophisticated meta search engine, because of features such as the application of advanced Boolean operators, the ability to search both natural language and highly structured retrieval language; and the ability to adapt to the command language of each search engine. It is possible to search in English, French, Italian, German, Spanish, Portuguese or Dutch.

There are also some problems to be reckoned with when using meta search engines:

- The difference between the search syntax of search engines can limit the features provided for a single search form. This means that if a single search form is used, there may be some search features that will not appear, because they do not apply to all the search engines

covered by the meta search engine. This is because there is no standard method or construction of search strategy among the various engines. They all have their own separate, unique interface and search rules.
- Duplicate records are not always detected and eliminated.

There are both general and subject specific meta sites, for example for business, chemistry, economics, medicine and biological sciences. As more and more meta search engines are developed you, as a reference librarian, need to keep abreast so that you are in a position to always select the best option when providing your service. Search Engine Watch (http://searchenginewatch.com) is a site that gives the latest information on search engines. It is a good site to check regularly.

7.5 SUBJECT DIRECTORIES

Human indexing

Subject directories differ from search engines in the sense that the sources covered by the database are identified and collected by humans who are also responsible for their maintenance. Yahoo!, Gigablast and dmoz.org are examples of directories.

Directories take more time to compile since humans have to evaluate the content of the internet resources before deciding what to include in the directory. Humans then index the content of the information resources by assigning keywords or subject headings. Thus, when directories are used to retrieve information, they do not search the actual content of the site, but only the words that were assigned by the human indexers. Directories are, therefore, useful if you expect to find a lot of information, but are interested in retrieving only a few highly relevant information resources. See the image of the demos directory's main page with the heading at figure 7.2

Distinguishing features

Subject directories tend to be smaller than the databases of search engines; which means that the lists tend to be shorter as well. However, there are also other differences between search engines and subject directories that can lead to the latter producing more relevant results. For example, while search engines typically index every page of a given website, a subject directory is more likely to provide a link only to the site's home page. Furthermore, since the maintenance of subject directories involves human intervention, they greatly reduce the probability of retrieving results out of context. They also provide more guidance on how to search and are, therefore, preferred by those who are newcomers to searching the internet.

7.6 INTERNET SEARCH STRATEGY

As in the case of the manual search strategy and the conventional online search strategy for databases, you need to plan a strategy for an internet search in order to create exact matches between the terms you are searching for and terms used in the documents you want to find. You, therefore, need to:

- interview the user to determine what exactly is required
- decide which search tools to select
- know how to conduct the search

- evaluate the internet resources accessed
- know how to present the search results

All these form part of the search strategy and will be discussed below.

7.6.1 Interview

When searching for information on the internet, the following questions should serve as a point of departure

- Exactly what information are you looking for? This question will help you refine the topic.
- Why do you need the information? The answer to this question will help clarify the purpose for which the information is required as well as the type of information required which might help you to select an appropriate search engine.
- How much information is required? This will determine if only a few highly relevant resources are required or as many as possible.
- How soon is the information required? This will determine the scope of the search.
- Which period should be covered? This will determine the search approach to follow.
- Which document types are required – books, journal articles, government publications or patents? These will also influence the choice of search tool.
- Is the internet the most appropriate place to search for the information? The internet is not necessarily the most ideal, convenient or reliable source of information.

These questions will enable you to decide on appropriate search engines and consider the tactics you will follow to access the required information.

7.6.2 Selecting search engines

Search options

The selection of the most appropriate search engine can be a daunting task. As you have learnt from the discussion of the different types of search engines, each has its own database with its own command language, search capabilities and method of displaying results. Most of the search engines offer different options for searching as well as refining a search. The options offered depend on the software being used. The search options may include the use of Boolean operators, proximity operators, truncation, field searching and so forth.

When evaluating search engines there are some broad categories you need to consider before selecting a search engine for dealing with a particular request. A number of search sites have adopted Google as their database. The following list reflects some of the more important criteria that need to be considered:

- Size off database. Small databases are usually attached to pick lists, medium-sized databases will usually have pages that the larger ones miss, and larger databases are more difficult to search accurately.
- Database coverage. Some databases index all pages, others only popular pages (which are good for finding 'hot' topics); or they apply quality control which suits academic work.
- Method of indexing. Databases vary in their method of indexing which can be full-text indexing (good for specific searching), keyword indexing (good for general searching) and human indexing (involving quality control).

- User access to the database. Some provide a “pick list” option, which is a good place to start; or a search engine which is much more powerful and offers a much larger selection of pages.
- Search options. These include search methods such as Boolean logic (some search engines do not allow Boolean searching), pseudo-Boolean search methods (which are offered by most search engines) phrase searching (which is a most powerful way of finding what you are looking for), term weighting (for ranking relevance) and truncation (most search engines allow some form of truncation).
- Presentation of results. The presentation of results includes relevance information (some databases tell you the number of terms matched and give you a relevance score for each document), abstracts, and an option for continuing the search (some databases make it easy by providing a “find more like this one” option).

It is evident from the above that you cannot expect to use one database for all your searching just as you cannot use the same reference book for all your questions. You need to select the proper tool for your searches. Try more than just Google. Regular use of these search engines is the best way of understanding their individual strengths and shortcomings. Below is an example of the options offered by some of the major search engines.

Before learning the finer details of internet searching, you should familiarise yourself with a variety of search engines and learn as much as possible about them and the search techniques they use. This will enable you to take advantage of the resources offered by the web without wasting too much time.

7.6.3 Actual search

Search tactics

The actual searching involves a number of tactics to obtain the best possible results. Although there is no specific procedure that can be followed, there are at least a few consecutive steps you can follow to streamline the process. For example, the search cannot proceed unless the query has been translated into search terms. Thereafter, you will need to combine search terms and examine your results from time to time in order to decide how to continue with the search.

(1) Translation of the query into search terms

Current technologies are so advanced that they can take your information need and turn it into a search request. As learnt when discussing the different search engines, it is now possible to use natural language to find information on the internet. However, in reference work we are professional and need to conduct searches professionally. To start with, you have to think carefully about the request and come up with as much detail regarding the needed information as possible. You must be specific to be successful, because computers work better when they are given specific instructions. The more specific the search terms, the better the results are likely to be.

The second step is to break down the search request into individual facets or keywords. This will simplify your search to focus on the important ideas.

Search terms

Once you have done this you have a basis for searching. However, there are still some things to consider about your search terms. These are:

- **Synonyms:** It always helps if you come up with synonyms for each keyword of your search

request. The more synonyms you can come up with for each keyword the better the chances that the computer will match your search request.

One problem with synonyms, however, is that each search term should have more or less the same number of synonyms, or the computer will "weight" them differently in order of importance to the search. (Weighting will be discussed later in more detail.)

- **Homonyms:** Care should be taken when choosing words that have more than one meaning such as China and china, or Polish and polish. The computer does not know the difference and cannot tell the context of the terms. It is better to avoid these terms if possible.
- **English dialects:** In cases where words are spelled differently as in American and British English, you will need to include all variations for an inclusive search. Words like colour/ color or catalogue/catalog will allow you to select websites from one country or the other. If you want to search websites from both countries, you will have to include both spellings in your search.
- **Truncation:** Truncation involves trying to look at multiple forms of a word (like woman and women). As in the case of conventional online searches, you can indicate it with a symbol (egg ?, #, $) used by the particular search engine. Some search engines such as Lycos only allow right truncation, meaning truncation at the end of a word (egg child$ for children, child, childlike, childhood). Try to use the simplest form of each word in your search term and use truncation symbols.

(2) Combining search terms

By indicating the relevance of your search terms, you can help the computer to search sites in an order that is more relevant to you. You can do this through phrase searching, Boolean logic, pseudo-Boolean logic and term weighting.

- **Phrase searching:** Phrase searching is the most powerful of the combination techniques and you should always use it if possible. When creating your search terms you can indicate words that usually go together in a phrase by placing them in quotation marks (" "). Nothing will increase the accuracy of the relevancy more than using phrases to search when appropriate.
- **Boolean logic:** Boolean operators such as AND, OR and NOT are placed between search terms to indicate the relationship between the search terms for the web database. Not all web databases allow you to do Boolean searching.

By putting the word AND between two terms you are telling the database, "I want to find pages that have both these terms. The page is not useful to me if it has only one or the other."

The OR operator is used to indicate a broader search.
NOT can be used in special circumstances, such as offering you a means of eliminating a homonym. If you want to look up things that are Polish (ie from Poland), and you do not want anything on shoe polish, you can use (Polish NOT shoe). Notice that you always group the NOT in parentheses.

Before continuing, make sure you understand when to use AND (for combination and narrowing; between different concepts) and when to use OR (to broaden a search – for synonyms). If you are not confident in using the Boolean operators, take another look at section 6.3 in the study guide. These are essential concepts in Boolean searching.

- **Pseudo-Boolean logic:** Many search engines allow "natural language" searching which involves two symbols, + and 7, for pseudo-Boolean operations.

If you include a "+" sign before a search term or a phrase it means that the term MUST be in all sites that are returned. It is very similar to a Boolean AND. You might use it if you want to find pages about a person, for example: + "Scott Nicholson".

This request would gather all the pages with the phrase "Scott Nicholson" on them. If you include a "7" before a search term or phrase, it means that the term should not be in all sites that are returned. It is similar to the Boolean NOT.

- **Term weighting:** The final technique used in combination searching is to weight your terms. By "weighting" you tell the search engine that some terms are more important to you than others. Different search engines have different techniques for weighting. If you have more synonyms for one search word, that the word will carry more weight in the relevance ranking. Thus, if there is a facet of the search you feel needs to be emphasised, enter more synonyms for the term. This does not always hold true, but is a good rule of thumb.

7.6.4 Examining the results

Limited selection

When you get your results, do not give up hope. At least look at the first 50 listings. If there is nothing at all on your search topic, try a different search or a different search engine. The more time you spend on term selection and combination the less time you would have to spend on results analysis.

When looking at your results, glance at the WWW addresses – pages with similar addresses are probably from the same site and can be skipped once you have seen the site. The best type of page to look for is one that has other links on the same topic – this is the best way of exploring.

Another good term to look for is FAQ (frequently asked questions) for an introduction to a topic. If you do not find what you are looking for you must either change your search or move to a different database.

7.6.5 Continuing the search

Select appropriate websites

If you want to change the search, the best way to do it is to examine web pages that resemble what you want. If you can find one page that is similar to what you are looking for, scan the page for phrases, synonyms, or search terms you could add to your search.

A good rule of thumb: if your page selection is too broad, you need to add more terms with AND. If the selection you obtain is too narrow, you need to remove search terms or change some ANDs and ORs. If there are lots of articles on a term that ignore the other terms, remove some of the synonyms. However, the fewer search terms you have, the more pages you will have to go through to find what you want.

Find button

Some search engines (such as Excite) have buttons you can click on to "find more pages like this one". By using this feature, you can narrow down the search to a group of relevant documents relatively quickly. This is a good feature when you have trouble to come up with synonyms. If you can find one page you like you can easily find others. Google scholar offers a "related articles" link that can lead you to more information on your search.

7.6.6 Tips on conducting searches

Now that you are aware of the steps followed during an actual search, you can study the general guidelines you should consider if you want to increase your success.

- **Know what you are looking for:** Do you want something that is published on the web, or information posted in newsgroups? Some search engines concentrate on the web, others focus on newsgroups and there are also those that give you the option of both. There are specific blog search engines that will lead you to blogs on a topic that interest you or the enquirer or are useful in your searches such as Technocratic (http://technorati.com).
- **Read the instructions:** Most keyword indexes (ie search engines) provide their own set of operators, delimiters and rules to help you search them efficiently. Read the instructions and take advantage of each index's advanced features (egg Boolean operators or proximity searching).
- **Watch for variations among services:** No two search engines work in quite the same manner. While some search tools are case sensitive by default, others allow you to choose whether or not a search will be case sensitive. Many indexes ignore words of three or fewer letters. Some search only databases of keywords, while others search the complete text of pages.
- **Watch for implied OR:** Some search engines (egg AltaVista) use an implied OR rather than an implied AND when you provide more than one search term and use no other search refinement feature. This may result in your obtaining documents which have nothing to do with one or more of your terms.
- **Think before you type:** Is there a synonym for this word? Is there another, less common word that would also be on the site you are looking for? Can you insert a modifier to narrow the search? If the answer to any of these questions is "yes", you must review your search terms before you start.
- **Choose the unusual word:** Often, a more distinctive word will sharpen your search. For instance, you will get a more targeted search with "laptop" than with "computer".
- **Watch your spelling:** Remember to search for legitimate spelling variations such as colour and color.
- **Use the find button:** After following a link to a document retrieved with a keyword index, it is sometimes not immediately apparent why the document has been retrieved. It may be because the words for which you searched appear near the bottom of the document. A quick method of finding the relevant words is to click on your web browser's find button to search for the relevant text in the current document.
- **Bookmark your results:** If you are likely to repeat a search at a later date, add a bookmark to your current search results.
- **Right truncate URLs:** Often, a search will retrieve links to many documents at one site. For example, searching for the Unisia library will retrieve not only the library home page (http://www.unisa.ac.za/library/index.html), but also any pages that contain the phrase Unisia library whether or not they are linked to the library's home page. Rather than clicking on each URL in succession to find the desired document, truncate the URL at the point at which it appears most likely to represent the document you are seeking and type the URL in the location box of your web browser.
- **Guess URLs:** Basic knowledge of the way in which URLs are constructed will help you guess the correct URL for the given website.
- **Examine only the first 15 to 30 hits:** Most keyword indexes rank the results of your search in order of decreasing relevance based on a scoring algorithm; documents with a higher score appear near the head of the ranked list. Consequently, it is often not necessary to browse

through more than the first few pages of results; even when the total number of results may run into thousands or millions.

Examine some of the most promising looking hits and jot down other terms you can use to narrow or broaden your search.

- **Use more than one search tool:** There can be some surprising results from a single query performed on several search engines. Thus, to make sure that you have got the best results, consider trying your search with several search tools.
- **Try specialised sites:** You will find many specialised sites at Yahoo: computers and internet: World Wide Web: searching the Web.
- **Be flexible:** In the ever changing landscape of the internet, a critical skill is to adjust to new surroundings. You must be prepared for a change in formats and access methods and a fluctuation in performance and the types of services offered.

7.7 CONCLUSION

In this study unit you have been introduced to the manner in which internet search tools such as search engines and subject directories are designed and how they enhance search activities on the internet. You have been made aware of how the quality of access tools differs from that of the more sophisticated tools developed for online access; and how search tools for the internet are designed to accommodate more refined searches. You have also learned about the techniques that are applied in internet searching to comply with the need for relevant information instead of a high retrieval rate of items that are irrelevant. Guidelines for evaluating and comparing search engines have also been introduced.

Considering the impact of the internet on reference work, and how search techniques differ from more sophisticated online search techniques, it becomes apparent why reference workers need to know how to search the internet effectively. In addition to the above, we have also introduced you to digital searching which currently plays a prominent role in digital reference services.

7.8 REFLECTION EXERCISES

EXERCISE 1

Can you think of a major difference in the design of search engines from that of subject directories?

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EXERCISE 2

Indicate whether you think the following statements are true or false.

Statement	True	False
(1) A spider is a program that gathers information from websites		
(2) When you are using a search engine you are searching the internet "live"		
(3) An algorithm is a strategy used by a robot while searching the web		
(4) AND is used to broaden a search.		
(5) Boolean logic is used in phrase searching		

EXERCISE 3

Complete the following statements by selecting one of the following words:

spiders, meta search engines, directories

(1) ..... were developed to search several search engines at the same time.

(2) ..... collect information to be indexed by search engines.

(3) If you know in exactly which subject category to search ..... are more suitable.

EXERCISE 4

Here is a quiz for you to answer. Read all the options and tick the block on the left that you think is correct.

(1) Which is better?

A	A web database that indexes every single word on every single page
B	A web database that only indexes important terms and phrases
C	A web database that indexes by placing pages in a pre-made directory structure
D	There is no way of telling without knowing the search request.

(2) If you want an introductory group of web pages on football, which type of tool is most suitable?

A	A full-text indexed database
B	A keyword-indexed database
C	A directory-structured database
D	A Usenet News search tool

(3) What is the most important consideration when deciding how to type in your search request in a search engine?

A	Enter the search request in the way you thought of it.
B	Make sure the proper nouns are capitalised.
C	Specify and simplify the search request
D	Make sure you do not enter any homonyms.

(4) Which of the following Boolean operators best suit the search request "I want information on vaccinations for lockjaw, also known as tetanus"?

A	vaccination OR (lockjaw AND tetanus)
B	vaccination AND (lockjaw OR tetanus)
C	vaccination AND (lockjaw AND tetanus)
D	vaccination OR (lockjaw OR tetanus)

EXERCISE 5

Compile your own list of criteria and draw up a chart comparing any two search engines of your choice.

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7.9 SOURCES CONSULTED

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7.10 ANSWERS TO EXERCISES

EXERCISE 1

Humans are involved in assigning keywords or subject headings for a directory while computer programs are used by search engines to identify, retrieve and locate information on the web.

EXERCISE 2

(1) True
(2) False
(3) True
(4) False
(5) True

EXERCISE 3

(1) Meta search engines
(2) Spiders
(3) Directories

EXERCISE 4

(1) D
(2) C
(3) C
(4) B

TOPIC 3

Evaluating reference sources and services

In this section of the study guide we will consider the current state of reference services.

Although evaluation activities are mainly the responsibility of the managerial staff of an information service, it is important that the professional reference worker should be aware of the level of reference services provided and of current trends that might necessitate changes in current practices. In this sense, the evaluation process enables reference workers to understand better what they could improve or do differently in the reference environment. It also helps them to understand what causes pressure and a heavier workload. The insight gained from the evaluation results will enable the reference personnel to respond to current demands more effectively to the advantage of the interested parties, namely the reference service, the reference sources, the reference personnel and the users of the reference service. In the end reference services can only benefit from regular evaluation activities.

This section comprises two study units, namely study unit 8 which introduces you to the criteria for evaluating information sources; and study unit 9 which introduces you to the different aspects of the reference service that have to be evaluated on a continuous basis. Fundamental to these units is the knowledge you have gained from the study units in both topic 1 and 2 and from the first level 1 Module AIS1503. The contents of those study units will enable you to develop a much better perspective on the issues you have to deal with in reference work; and the impact of forces such as information and communication technologies, financial constraints and demographic changes on the reference environment.

CONTENTS

STUDY UNIT 8: EVALUATING REFERENCE SOURCES
STUDY UNIT 9: EVALUATING REFERENCE SERVICES

STUDY UNIT

8

EVALUATING REFERENCE SOURCES

You have learnt about the different types of reference sources in the first-level Module AIS1503. Do you remember that there are numerous types of reference sources? Since there are so many of them at your disposal, you need to be able to distinguish the good from the mediocre or bad. Remember also that when users come to you they expect to receive reliable information. There is no point in using a source which is not authoritative or current since the information you find will be questionable. In this study unit you will learn about several criteria we apply to printed, electronic and internet resources so that we can judge how suitable, useful and relevant they may be to the information needs of our users.

8.1 INTRODUCTION

According to the Cambridge Advanced Learner's Dictionary, the verb "evaluate" means to judge or calculate the quality, importance, amount or value of something (http://dictionary.cambridge.org/define.asp?key=26523&dict=CALD). From this definition, we can say that to evaluate reference sources, we judge the quality of these sources as providers of reliable information. Thus, evaluating reference sources involves examining the sources according to given criteria in order to determine how authoritative they are.

Section 8.3 of this study unit requires you to work independently through chapter 9 of Bibliographic control and information sources (3rd edition) by SJ Behrens. (See the overview at the beginning of this study guide for the details of this book.)

LEARNING OUTCOMES

After studying this study unit you should be able to

- explain the importance of evaluating information
- describe the general criteria for evaluating reference sources

- evaluate any printed or electronic reference source according to the criteria of authority, purpose, scope, currency, audience, treatment, objectivity, format and arrangement
- apply specific criteria to judge the reliability of internet information for reference use

KEY CONCEPTS

Evaluation criteria: A set of values that enable us to determine or judge an information source. The evaluation criteria focus on certain aspects of an information source which may be rated positively or negatively – the more positive the rating the better the source.

Electronic reference sources: Reference sources that are available in electronic format – can only be accessed by a computer. Some electronic sources are available through the internet. For example, a dictionary on CD-ROM or an in-house directory on the intranet of an organisation can be accessed offline.

Internet reference resources: The internet is packed with information sources and databases that are useful for reference purposes. Online dictionaries and encyclopaedias are examples. Many websites increasingly provide reference information that was previously available in printed books (the Unisa calendar and South African government website are examples).

Printed reference sources: Conventional reference sources such as dictionaries, encyclopaedias, directories and so forth are still available in printed format. In some cases, versions of these are also available in electronic format.

8.2 REASONS FOR EVALUATING REFERENCE SOURCES

Personal *vs* professional

We can consider the evaluation of information sources from two separate angles. First, you could evaluate a source for personal use: for example, you are doing an assignment for one of your courses (say, Communication Science) and want to make sure that the books you are planning to cite from are authoritative. Secondly, there is the professional evaluation of sources before they are added to the collection of an information agency like the library. This is where the information specialist (eg librarian) is involved in collection development.

Collection development

In this module we concentrate on the evaluation of reference sources to assess their suitability and substance in view of the development and management of the reference collection. You will also learn about the criteria for electronic sources and websites.

8.3 INDEPENDENT STUDY

When you go through the prescribed chapter for this study unit, bear in mind that you should approach evaluation from the point of view of a reference worker (ie an information specialist) and not as an individual user. In other words, you should regard the criteria as a means of assessing whether a source is suitable to be purchased for a reference collection.

Compulsory prescribed reading
Chapter 9 of Bibliographic control and information sources (3rd edition)

This chapter is not difficult. You will learn about the importance of evaluating information sources and the main evaluation criteria for printed reference sources.

8.3.1 Criteria for evaluating printed reference sources

Some of the criteria such as authority, scope, currency, audience, treatment and objectivity are general which means that these criteria apply to all types of sources. But when it comes to format and arrangement, the nature of printed sources, being on paper and bound, requires different criteria from those applied to electronic sources. These criteria are then applied to an encyclopaedia so that you can see how they work in practice.

8.3.2 Criteria for evaluating electronic reference sources

The criteria mentioned in section 8.3.1, namely authority, scope, currency, audience, treatment and objectivity also apply to electronic reference sources. Then there are additional criteria such as hardware and software requirements, command language, user interface, output features and technical support.

8.3.3 Criteria for evaluating internet reference sources

The World Wide Web is, in fact, a reference resource rich in a variety of reference sources such as websites and databases. Thus, in addition to the general criteria and the additional criteria for electronic sources, the internet needs its own criteria.

Note: Chapter 9 of the prescribed book mentions TONIC and the Internet Detective, which used to be online tutorials you could use to learn how to evaluate internet documents. These tutorials are unfortunately not available anymore.

The University Libraries of the Virginia Polytechnic Institute and State University posted guidelines for the evaluation of internet reference sources on their website: http://www.lib.vt.edu/instruct/evaluate/. There are five main focus areas, namely authority, coverage, objectivity, accuracy and currency. Main criteria are indicated for each of these five focus areas. It is important that you know the five focus areas; understand their criteria and why they are important; and how to apply them when evaluating a source or resource. Test yourself with the reflection exercises below.

8.4 CONCLUSION

The web is a particularly important resource for reference workers. As with other electronic sources and printed reference sources, you should be able to apply evaluation criteria to web sources and judge their authority.

In the last unit the evaluation of reference services will be discussed.

8.5 REFLECTION EXERCISES

EXERCISE 1

(1) What is meant by the authority or authoritativeness of a book?
(2) Why is it important to confirm the authority of a book?
(3) How can I tell if a book is authoritative?

EXERCISE 2

In chapter 9 of Bibliographic control and information sources (3rd edition), you learn about evaluating sources. To practise your skills in evaluating printed sources, choose (1) a dictionary and (2) an encyclopaedia and apply the following criteria. Jot down brief notes which reflect your opinion next to each criterion.

CRITERIA	CRITERIA DICTIONARY Title ..... Edition ..... Publisher ..... Year	ENCYCLOPAEDIA Title ..... Edition ..... Publisher ..... Year .....
Authority		
Purpose		
Currency		
Audience		
Objectivity		
Treatment		
Format		
Arrangement		
Any other		

8.6 ANSWERS TO EXERCISES

EXERCISE 1

(1) The authority or authoritativeness of a book is the extent to which the information in the book can be depended on to be authentic, true or fair.
(2) It is important to confirm the authority of a book in order to be sure that the information given in the book is reliable and that you can use it without fear of being misinformed.
(3) You can tell if a book is authoritative by checking the credentials of the author, such as his/her qualifications and experience in the subject matter of the book. It is important to know that the author is an authority in the subject through research or other affiliation that proves that he/she knows what she is writing about. You can also check the reputation of the publisher, because it is the publisher who ensures that there is quality control through editing of content by specialists.

STUDY UNIT

9

EVALUATING REFERENCE SERVICES

9.1 INTRODUCTION

Reference services have adapted over time to meet the needs of their user communities. They have to be evaluated to establish whether current reference services are still meeting the demands of users and the environment. The outcome of the evaluation should serve as a guideline to adapt or expand the reference services to comply with current user requirements.

The purpose of this study unit is to introduce you to the different levels of reference work that need to be evaluated in order to establish whether the current service is still required in its entirety or only in part. In the discussion of each level, you will learn about the issues that need to be dealt with during an evaluation session.

There are a variety of techniques for evaluating reference services. However, since most of the evaluation techniques are usually implemented by managerial staff of information services, they will not be covered by this study unit. Understanding the different types of techniques requires a study of its own which is beyond the objectives of this study unit. The different types of techniques will be mentioned only briefly here. These include unobtrusive techniques, surveys, samplings, interviews, observation, quantitative studies and qualitative studies.

LEARNING OUTCOMES

After you have worked through this study unit you should be able to:

- explain why reference services should be evaluated
- identify the different categories of reference services that need to be evaluated
- identify new trends emerging in the reference environment
- distinguish between the different types of reference services that are currently operative
- think critically about contentious issues with which reference workers have to grapple in practice

KEY CONCEPTS

Burnout:	Also known as technostress; refers to the anxiety and psychological pressure created by the continually expanding range of electronic tools reference workers have to master.
Hybrid service:	Refers to an information service where printed and electronic sources co-exist.
Paraprofessional staff:	Refers to reference workers who are not fully trained in reference work and may lack the required subject knowledge and experience.
Proactive service:	Refers to a service that is provided in advance to meet the needs of users in comparison with a reactive service that responds to needs expressed.
Reactive service:	See the explanation above.
Roving reference:	Also known as floor walking; where reference workers assist users at their work stations when help is required.
Tiered service structures:	Refers to the division of reference service activities according to level of complexity in order to optimise limited human resources.

9.2 PURPOSE OF EVALUATING REFERENCE SERVICES

The purpose of evaluating reference services is to obtain a perspective on the quality of the existing services and to plan for ways in which services can be improved. We also need to know whether the set goals have been achieved and whether the new trends in the overall information environment have been accommodated by the existing reference services. The main aim of evaluating the different levels of reference work is to:

- detect gaps in whatever area they may occur
- determine whether the reference collection and facilities are still on a par with current trends and to respond to the results with effective action
- improve services to the users in the long run
- improve circumstances for the staff responsible for providing the service
- justify the existence of the reference service

9.3 REFERENCE SERVICE COMPONENTS TO EVALUATE

Categories

As indicated earlier there are several aspects of reference work that can be evaluated. These aspects can be classified under four broad categories as inputs, outputs, outcomes and current trends as indicated in the box below:

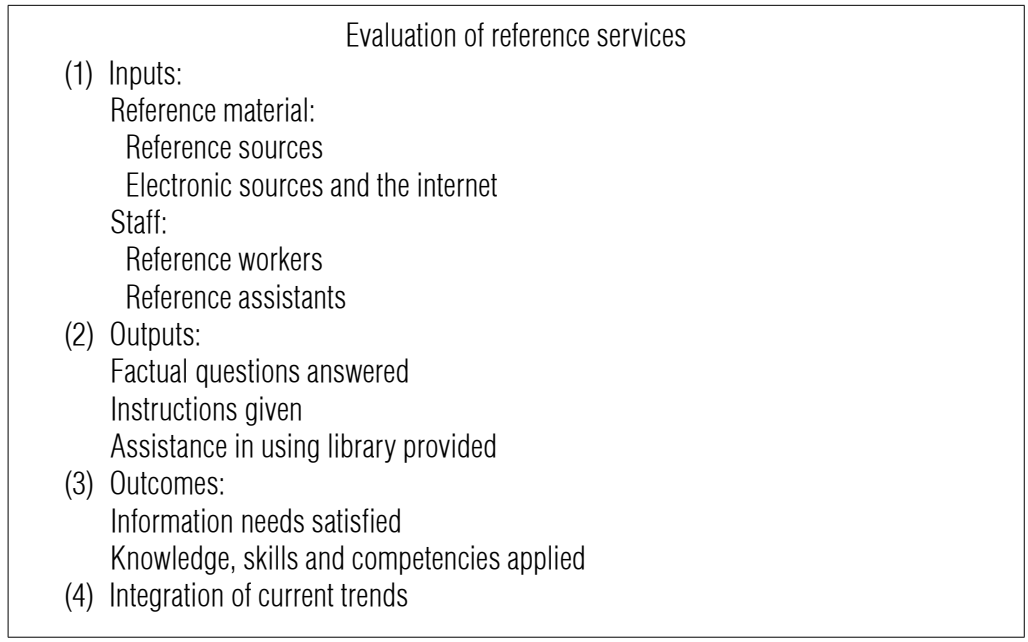


Figure 9.1

Evaluation of reference services

9.3.1 Inputs

Input components

Inputs refer to those resources needed to establish a reference service. No reference service can be provided without reference sources, reference tools and trained staff to carry out the various reference functions. If any of these inputs do not meet the demands of their particular user community, or the level of service desired, the effectiveness of the reference service will be seriously hampered. These inputs are discussed below.

9.3.1.1 Evaluating physical reference collections

Criteria for reference sources

The reference collection should comply with three basic criteria for evaluation. Each reference source in the collection needs to be subjected to the criteria as discussed in study unit 8. Collectively there is also a need to judge the extent to which information included as reference sources is up to date, and how the materials in the collection and their inclusion in standard lists are utilised.

Size

The size of the reference collection is related to the nature and the type of information service. An information service such as the Unisa library, which provides services to students in different courses and levels, covers numerous subject fields and serves a large variety of academic staff, will inevitably have a larger reference collection than a special library which only covers a limited number of subject fields or users.

Reference collections should be small enough for reference staff to be reasonably familiar with all the tools, the kinds of information they contain and the kinds of questions they can answer. The evaluation of a reference collection can be best carried out by dividing the collection according to topics, with reference staff responsible for evaluating topics assigned to them. The staff decide which items should be withdrawn or transferred to another part of the library collection.

Currentness

The usefulness of a reference collection also depends on how updated the materials are. Items that are outdated cannot provide accurate or authoritative information. The quality of service can be influenced by the extent to which materials are up to date.

9.3.1.2 Evaluating electronic sources and internet resources

Ease of use

With the introduction of electronic information in the reference process, the evaluation of reference sources has acquired new dimensions. Some databases and sources may be locally available (eg OPAC), while others are only accessed remotely through a network or the internet.

Print versus electronic sources

Another point to consider is whether to replace printed sources with electronic sources in the current situation where electronic counterparts of printed reference sources are proliferating, especially when costs, completeness and ease of use are to be considered. It is also important for reference workers to consider expanding their own online public access catalogue (OPAC) to include periodical holdings and holdings of other material that was not traditionally accommodated in the OPAC in order to enhance usability.

Impact on service patterns

Electronic sources and internet resources have also had an impact on service patterns. For example: combining search terms and printing citations and abstracts are added responsibilities and require staff with the necessary skills. These developments have also increased the demand for assistance from users, which has affected the reference worker's interaction with the enquirer, taking him/her away from the reference desk. All this calls for an evaluation of the workload of the existing personnel.

Challenge of commercial services

Online services, which are commercial services, challenge reference services. They offer greater convenience, but there is increased public awareness of online information access. New facilities such as e-mail have been made available to communicate with users. Online services and the internet have become an integral part of the reference worker's search tools. Reference workers view technology as an invaluable and useful tool. However, online services need some improvement in terms of consolidation of systems and standardisation, as far as search techniques are concerned. Therefore, the features of the various online services need to be considered before a choice is made for a particular reference service, bearing in mind the current personnel situation as well as the demands of the user community for such services.

OPAC is another electronic source which has become an integral part of reference services. Each reference service should evaluate its situation and decide whether the current service needs to be expanded to include additional services to its user group such as remote access. Digital reference services have become more prominent and also need to be considered.

9.3.1.3 Evaluating reference staff

Professional reference workers

The question that individual reference services should answer about their current reference staff is whether they need all their highly qualified professional reference workers or whether they can be replaced by paraprofessionals. It seems that the impact of more advanced technology has resulted in a need for fewer trained reference workers and that the traditional reference questions can be answered by trained paraprofessionals. Reference services should decide whether instruction to users in the technical issues of electronic access cannot be carried out by paraprofessionals. Digital reference has placed new emphasis on bibliographic instruction (BI) that cannot be ignored. New skills and knowledge of software packages are required.

Competencies

The competencies of existing personnel should be reviewed from time to time in order to determine whether reference workers are keeping up with the demands of the service and the new technology. Reference staff should evaluate their knowledge of reference and other related sources and software applications to ensure that it is adequate to meet the demands of the user community.

The level of knowledge will determine how effectively an individual reference worker negotiates the reference interview, conducts a search and analyses the results of a search. Reference services should also establish whether individual reference workers have the required communication skills to interact with the users; and to convince others of the value and the purpose of reference services. Together with this goes the need to determine whether the reference workers have a positive attitude towards people and the reference process; and whether they show kindness, tenacity, patience, determination and an ability to solve problems and adapt to new ways. Web 2.0 and web 3.0 technology provide new ways of communicating with users and demand new competencies.

Improving qualifications

Continual education, particularly in new technologies has become inevitable in current reference services. Training in online searching and internet searching, for example, is essential in today's reference services. Reference services should ask themselves whether they meet the needs of their staff for continual education and in-service training.

Acknowledge achievements

Reference services should also establish whether they are committed to recognising and rewarding specialisation by their staff. They should be alert to signs of overwork and burnout among their reference personnel and identify the causes. For example: what causes stress for the reference worker(s)? Could it be, as a result of too many users to attend to in a short time, a heavy workload, difficult queries, rude or impatient users, working with faulty equipment, putting up with insufficient funds, resources that do not give up to date, correct answers or the clumsy search capabilities of modern technologies?

9.3.2 Outputs

The output of a reference service has to do with the manner in which activities are carried out and the level of reference services that can be offered considering the impact of modern technology on information service in general, the demands of the current user communities and the variety of assistance that can be given.

9.3.2.1 Evaluating reference transactions

Human interface

The traditional reference process is initiated with the encounter between the reference worker and the user. Given the changing information environment, reference services need to ask themselves if certain transactions are still necessary, and whether their existing staff can handle the required transactions. For example, online reference tools with user-friendly interfaces enable users to carry out simple, straightforward searches for information by themselves. Now the questions are:

- Are reference interviews still necessary?
- Is bibliographic searching still required?
- Where is the emphasis? Is it more on providing information, or on instructing the end user to access information himself/herself?
- Is the expertise of the professional reference worker required to decipher complex information requests?
- Does the reference service receive enough complex questions to justify the number of professional reference workers currently in service?

Evaluating abilities

Online search tools are widely used in conducting current searches. However, their search abilities vary and should be evaluated by reference workers as they use them. Reference services should determine whether the existing staff are aware of the different online services to evaluate the quality of the various search tools for a particular transaction, and to change tools if necessary. Without such knowledge a search strategy may fail with dire consequences for both the enquirer and the reference service.

9.3.2.2 Evaluating reference assistance

The main objective of a reference service remains to meet the needs of the users by providing personal assistance. Issues in this regard that need to be evaluated are:

- Who are the current users?
- What type of assistance is required?
- What impact does technology have on the needs of users: are they looking for instruction in accessing information or do they want the reference service to provide information sources?
- Does the current service meet the current demand?

Types of reference service

Sutton (1996) identifies a continuum of libraries (including reference services) that are currently operative due to changes in technology but also as a result of limited budgets. These range from the traditional library service to the digital library. What they offer is explained below:

- In a traditional service, information is obtained from the library's own collection.
- In an automated service all the information is in digital format and can be obtained beyond the local collection. This service requires personal assistance for direct information access and assessment.
- In a hybrid service, digital information and non-digital sources co-exist. Here more emphasis is placed on complex search techniques that are too difficult for end users.
- In a digital service no core collection of tangible sources is held, and the intermediary process (searching for information) is provided exclusively by machines. The reference worker's role is to control filtering, searching and sense-making tools.

Physical environment

The physical environment of a reference service should also be evaluated to determine whether it contributes to a user-friendly atmosphere. Questions to be asked are:

- Is the reference desk inviting or does it resemble a fortress?
- Is there place for users who are waiting to put down their belongings such as a backpack, note books and so forth?
- Is the consultation area exposed, that is, shared with other users?
- Is the attitude of the reference worker who is arrogant about his/her abilities switching you off?

User satisfaction

There are also other factors that should be evaluated with regard to user service. These are:

- How well does the service meet the needs of current user groups in terms of their information literacy?
- How well does the service meet the needs of remote users of the service and those who are unfamiliar with the service?
- Is the service provided proactive or reactive? (In other words, does the service meet the needs of the user community in advance, or does it respond to the needs when expressed?)

9.3.3 Outcomes

Effectiveness

The outcomes of a reference service are the result of the actual assistance provided to the user community and the activities carried out to realise the projected aim of the service. These should be evaluated in terms of user satisfaction and the reference workers' level of competency.

9.3.3.1 Information needs satisfied

In order to determine whether user satisfaction has been achieved, the following questions should be asked:

Are the users satisfied with

- the type of service offered?
- the attitude, commitment, approach and skills of the reference staff?
- direct information or instruction facilities at their disposal?
- the hours of the reference service?
- the work and study areas at their disposal?

Contemporary users

The reference service should also determine whether contemporary users, including remote users, who are accustomed to the electronic environment, are satisfied with the type of service offered; or do they demand more sophisticated electronic services.

9.3.3.2 Personnel competencies

Digital literacy
Information literacy

Both information literacy (knowing how to find, evaluate, use and manage information) and digital literacy

(knowing how to find, organise, evaluate and create information using digital technology) are crucial in learning, teaching and research. Librarians need to keep abreast with new developments in information and digital literacy to be able to guide their users to find and evaluate online sources effectively.

9.3.4 New trends in reference service statistics and evaluation

Data gathering

As is to be expected, information technology has brought about changes that have resulted in new trends in reference services. Chan and Knight (2012) note that: "changing trends in reference service have also prompted the development of new processes for data gathering" with regard to reference service evaluation.

New web-based, online systems for the collection of librarian-mediated interactions to automate the gathering of quantitative and qualitative data are now available such as:

- **Libstats**: It hosts data for usage-statistics analysis in libraries. Libstats can compile descriptive statistics from reference service usage data and build a timely empirically-based profile of service performance. Website: http://www.lib-stats.org.uk/.
- **LibGuides:** The LibGuides Community Site aggregates all public content from institutions using LibGuides. Currently it is able to search and explore over 320,000 guides by more than 54,000 librarians at more than 3 800 libraries worldwide. Website: http://libguides.com/community.php?m=a.
- **Google Analytics**: Google analytics, a sophisticated web analytics tool, "provides a hosted service for web analytics, through which collecting and analysing web usage data can be done quickly" (Forbes & Brown 2012). According to them Google analytics is a valuable tool to monitor a website's traffic and the use of online resources. Website: www.google.co.za/analytics.

These electronic reference service evaluation tools have the ability to demonstrate the value of library staff and resources involved in reference services in a more comprehensive manner.

9.4 CONCLUSION

In this study unit we have concentrated on the factors that should be evaluated in order to provide an effective reference service at various levels. Fundamental to this discussion is the fact that individual reference services should view the various factors in the context of their individual circumstances. You have also learned that regular evaluation enables reference workers to learn to assess their environment, establish the needs and desires of their users; and capitalise on opportunities offered in their environment.

9.5 REFLECTION EXERCISES

In order to do these exercises, you will need to think about what you have learned in this and other study units of the study guide where the relevant issues are dealt with. In addition, you can use your own innovative ideas and possibly draw on your own experience in practice.

EXERCISE 1

Explain in your own words how the following influence reference services:

(a) roving reference
(b) tiered service structures
(c) digital reference

EXERCISE 2

Study the following questions carefully and prepare a well-substantiated view of your own on these issues:

(a) Has the core objective of reference services changed?
(b) What competencies are required for current reference work?
(c) Can reference services cope with the new demands of the new type of user?
(d) Is there still a need for a core collection of reference sources?
(e) What is the impact of digital reference on existing staff and services?

9.6 SOURCES CONSULTED

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9.7 ANSWERS TO EXERCISES

EXERCISE 1

(a) Roving reference: Where reference workers assist users at their work stations when help is required. Users need not leave their computer screens and learn on the spot how to alter a search to get positive results. It gives the reference worker better contact with the user who may feel exposed and not want to expose his/her inability to conduct a proper search. By walking among the searchers on the floor, a reference worker can easily spot such problems and come to the searcher's rescue without the searcher losing face.

(b) Tiered service structures: As a result of the impact of electronic technology and online search services, the reference worker's functions have changed. Work has been divided. Questions that do not require sophisticated bibliographic knowledge are answered by assistant staff while more complex questions (fewer in number) are dealt with by reference workers. Separate locations are assigned for different types of questions. More is done to enhance the perceptions that users have of the value of reference services. Limited personnel resources have been optimised. All this is as a result of the accessibility of local and remote databases, OPACs, and internet connections. Thus, the all-purpose reference desk service has been transformed into tiered services – a significant change.

(c) Digital reference provides access to more information and to previously inaccessible library holdings. Users (remote) are served 24/7.