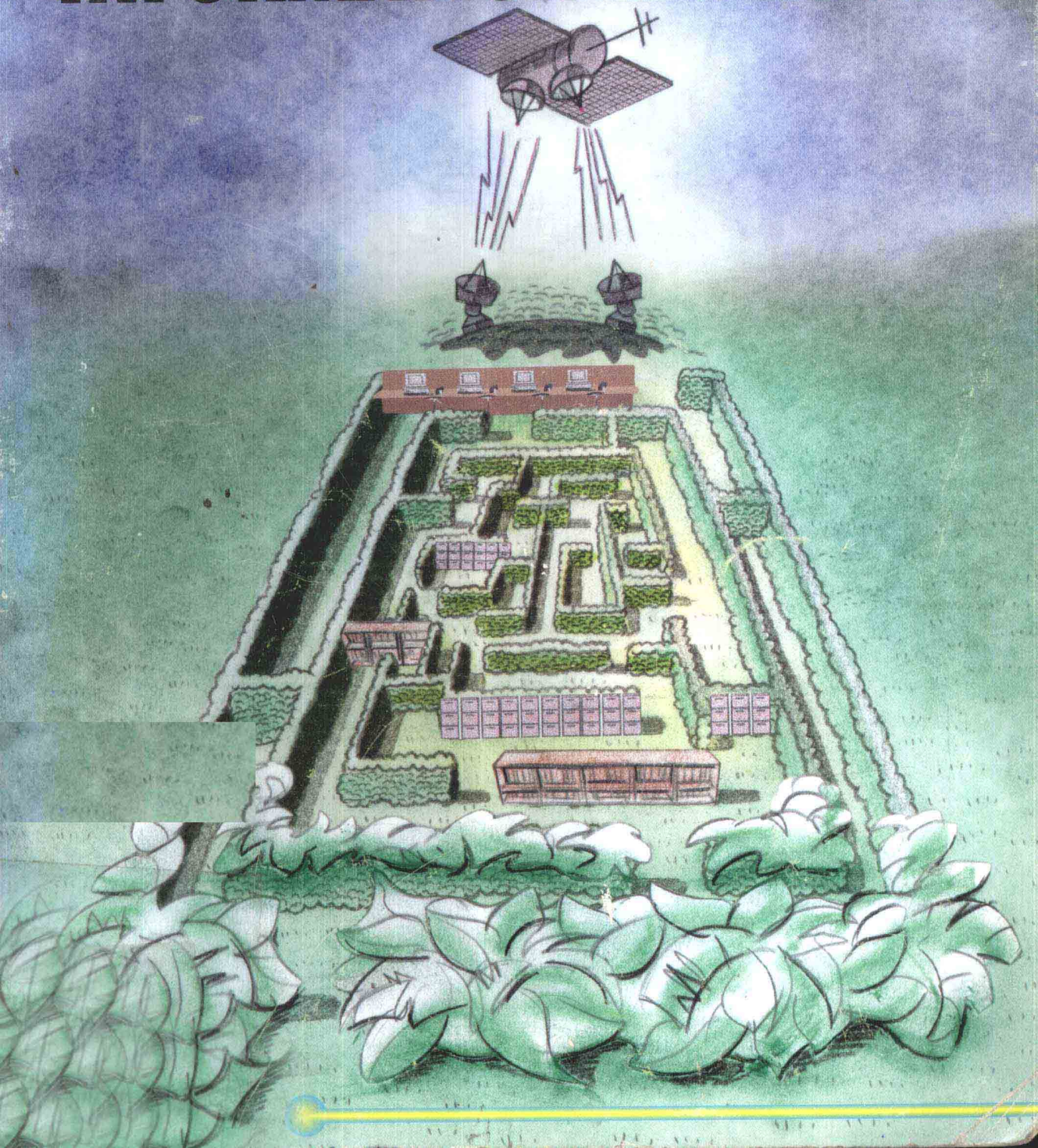


*An Introduction to*  
**INFORMATION RESEARCH**



# Introduction to Information Research

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New York



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# INTRODUCTION

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What were the contributions of African Americans during the period of the American Civil War?

What time is it?

Does this drug have any adverse side effects?

How cold is it outside this morning?

Explain kleptomania, its causes and treatment.

How much is left in my checking account?

What did reviewers say about Margaret Atwood's novel, *Alias Grace*?

When is the next hockey game at the home rink?

How has the United States dealt with the Japanese-Americans who were interned in American concentration camps during World War II?

Am I eligible for this program/contest/loan/etc.?

Is the "greenhouse effect" serious or is it an over-dramatized issue?

Does bilingual education limit its recipients in their adult lives?

Who took the remote control for the TV?

Does any of these questions sound like something you've asked and answered already? Probably so. All these questions require information to answer them, and often getting that information will require you to do some "research." Research is investigation, detective work, exploration of something unknown. If you've answered any of these questions, you've been doing information research even though you may not have realized it and you'll continue doing it all your life, both on the job and off.

This book is about the more formal type of information research, the type that you do in an academic setting to fulfill a research assignment. Such an assignment can require you to write a paper, prepare a report, or present a speech in which you support whatever you say with information found through research. How you perform your research will affect your final product. This book explains the concepts behind information, its organization, tools used to find information, and how to identify useful tools and appropriate information; it relates these concepts to the steps in the research process. Understanding what information is and the way it is organized, and seeing clearly the individual components of the research process should make your research more efficient.

Remember that the real end-product of information research is increasing your store of knowledge about the research topic. Increasing your knowledge is a task that will be required of you not only in college but also “on the job.” Electronic information technology may make that task seem far more complex than it was in the past, but the technology hasn’t changed the fundamental organizational principles of information systems; it has changed the speed with which they can be used. When you learn the basics of information systems—how they’re organized, how they work—you’ll be able to do information research more easily and keep up with changes in information technology for the rest of your life.

*Carla List*  
*August, 1997*

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## CHAPTER

# 1

# The Organization of Information

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## What Is Information?

*“Data becomes information only when it’s put into a context.”*

(National Public Radio reporter John McChesney)

If you were asked this question, you might answer with a description of some printed information, the written knowledge found in books and magazines and newspapers. You would be right, but that is only a fraction of what “information” includes. One pretty complete definition of the word comes from the American Library Association, a group of information experts: “all ideas, facts, and imaginative works of the mind which have been communicated, recorded, published and/or distributed formally or informally in any format.” This means that information can be a fact that was recorded by a person using a stylus to etch it on a stone tablet, a folk tale that was handed down orally for many generations, a comic book that was printed and distributed to thousands of readers, or an idea that was communicated electronically through computers or television.

Information is everywhere and in great quantity. How can you deal with the vast amounts you encounter? Organization of information makes it manageable and helps you handle it rather than being overwhelmed by it.

## What Is Organization?

How organized are you? Does it make any difference in your life? Can you be organized without keeping lists or straightening stacks of things? What is organization, anyway?

**To organize is  
"to form . . .  
into a whole  
consisting of  
interdependent  
parts."**

*(Webster's  
College  
Dictionary)*

You organize things all the time, that is, you arrange things into a system so that the arrangement makes the parts "interdependent." An example of this would be your class schedule. Your classes aren't all held at the same time; you registered for one course that meets on Mondays, Wednesdays, and Fridays at 11:00 a.m., but not all your courses meet then. "Of course not," you say, "I'd never be able to go to all of them if they all met at the same time." So you registered for another course that meets at 1:00 p.m. Mondays, Wednesdays, and Fridays, even though that course had a section that meets at 11:00 on those days. The scheduling of the second course depended on the timing of the first course. And this interdependence is evident throughout your schedule.

Another example of organization in your life may be your collection of sound recordings, whether this is compact discs or cassette tapes or, if you're now an antique collector, vinyl albums. You've made organizational decisions in this collection that indicate that you understand how the items in the collection relate to each other and to the whole. If all you do when you buy a new recording is drop it into the front of the box, crate, stand or drawer with the rest of your collection, you've demonstrated a type of "organization by accession," in other words, the most recent item goes in front. This works well if you do not have too many recordings. But if your collection continues to grow you'll lose track of your moldy oldies and eventually you'll have trouble finding the recording you want to hear for old times sake. Sure, it's somewhere in the back, but how do you search for it? As your collection grows you move to a more sophisticated level of organization: you organize by content, that is, you use what's *on* the recording to help you decide where to put it. The information you find there will allow you to group your recordings by artist, or by type of music. You relate the parts to each other and to the whole collection, in other words, you create a system. You organize the information in your world in this and many other ways.

## Why Is It Necessary to Organize Information?

**Organization  
provides  
access to  
information.**

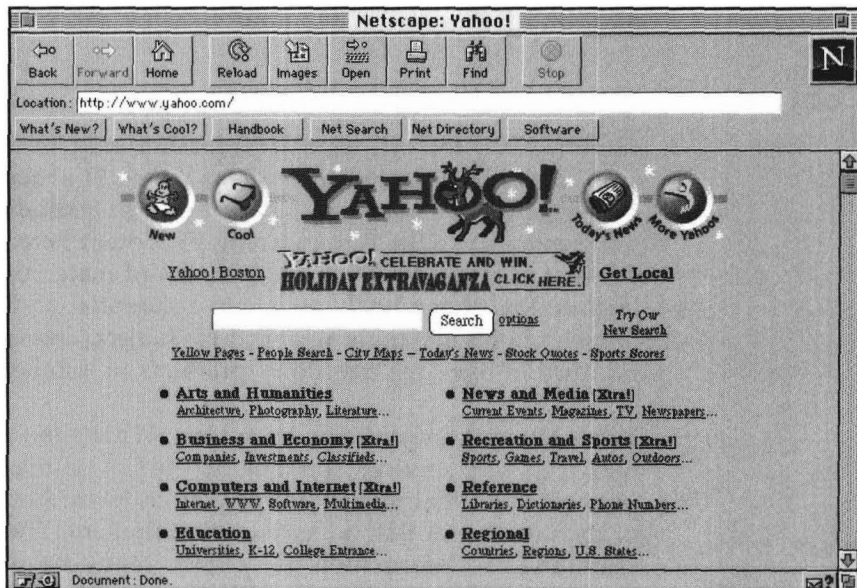
Now that you know what information is, you can see that the value of any item of information will be enhanced if that item can be used more than once, heard by more than one person, viewed by more than one viewer, or communicated to more than one receiver. Re-use of information won't be possible if it cannot be found after its first use. If there were no access to the vast amount of information that is available there might as well be no information.



How does organization provide access? As you learned above, organization is the arrangement of items into a system. A system establishes rules, or reasons for arranging items in certain ways, and then applies them consistently to the materials it organizes. In a good system the reasons that form the basis for the system remain the same throughout and are readily apparent or easily learned. Thus you, as a user of a system, can be confident that the way you learned how to find items one time in a particular system will work a second time, and a third time. Some systems you're familiar with include telephone books, libraries, and grocery stores. A type of system you'll meet soon, if you do not already know it, is a directory of resources on the Internet, illustrated by YAHOO! in Figure 1-1.

**FIGURE 1-1**

An example of organization on the World Wide Web: YAHOO!



## What Are Some Ways to Organize Information?

Information is often organized by using several criteria. One basic question can be asked about many information systems: Is the information in the system arranged by **content** or by **format**?

If you want more than one piece of information about a subject, you'll have to have some way of finding many items grouped together

because they all have the same content. *Content* is the major approach to arranging information.

*Format* refers to the medium used to present or store information. Information comes in many configurations: It's aural (you heard it on the grapevine), visual (you can read the writing on the wall), audio-visual (did you hear/see Whitney Houston's new music video?), and digital (you know those numbers mean something). Each of these configurations is a format, and within each there are variations like microfilm or paper, color or black-and-white, slide-tape programs or videocassettes, compact discs that hold music or software. Electronic resources, those found on the Internet, provide information in yet another format. Formats affect the ease of access to information, and can be used as another way to organize it. A brief discussion of organization by format can be found near the end of this chapter.

## Content and Organization of Information

**Content is:** 1) the *subject* of the information in an item; or 2) the *characteristic* of information in an item which is a) factual or analytical, b) subjective or objective, or c) primary or secondary. Most information systems use the first meaning of content here, that is, subject, as the first criterion for their organization of materials. Examples of this include the phone book, split into residential and business sections; libraries, with materials arranged by subject; and grocery stores, with produce in one area and dairy products in another.

**Most information is organized by subject.**

You often seek information by subject: What's the phone number of a pizza delivery service? You look up "pizza" in the *Yellow Pages* of the phone book. What movies are playing in town? You look on the pages of the newspaper that advertise entertainment. These are examples of searching for information by subject. Many businesses use subject-based organization systems because it simplifies access to their goods. Information systems are no different. In libraries, and now on the Internet also, materials are grouped by subject because it simplifies your search for more than one item about your topic. Once you learn how a particular system arranges its subjects you're able to search efficiently for your information needs, from pizza delivery to articles for a research paper assignment.

There are variations among subject-based organization systems. Some systems differ because the items being organized are very different,

for example, the *Yellow Pages* organizes a set of materials that are quite different from those in a library, so those two systems are similar but different. But sometimes the differences are to be found among systems of the same kind, that is, two libraries may use different systems even though both systems are based on the subject of the materials organized. How can you move from one system to another without getting confused? A good way to learn about a new system is to compare it to one you already know.

**A call number is the label used to keep books on the same subject together on the shelves.**

One subject-based information system that many people are familiar with is the **Dewey Decimal Classification System**. This system organizes information by looking at the subject content of books and assigning numbers to those subjects. A library that uses the Dewey system looks at every information item, determines its subject and puts it with other items that deal with similar subjects by giving it the Dewey Decimal “call number” assigned to that subject, and then shelving like numbers together. You know how to use this system: you get the call number for a book and you search for that number in the book “stacks” (library-ese for the rows of bookshelves). Do you need to know any more about it? Not really. And that’s how *any* subject-based information system works.

## The Library of Congress (LC) Classification System

The subject-based system used in most college and university libraries and in some large public libraries is the **Library of Congress Classification System**, or “LC” system. LC differs from the Dewey Decimal System in that it uses **letters and numbers** as the labels for its subject classes. This *alphanumeric* system results in the capability to expand far beyond a system that uses only numbers. Figure 1-2 shows you both the Dewey Decimal and the LC call numbers for the same books.

An important thing to remember about a classification system is that it allows the assignment of only one subject-number to each item in the system. This means that a book which is about several different subjects will have only one of its subjects represented by the call number assigned to it. For example, if you find a book on traditional medicine and Mexican-American folklore, it will have a call number that groups it with only one of those subjects, in this case, with the GR111’s, for “Folklore.” Figure 1-3 shows you an example of this.

When you discover the call number for a particular subject, all the materials that share that call number are about the same subject.

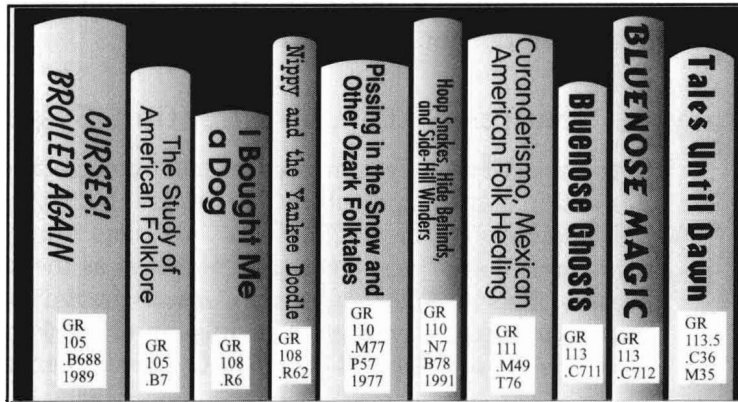
**FIGURE 1-2**

Dewey Decimal and LC call numbers

Dewey Decimal	(Title)	Library of Congress
398.2 B	<i>Curses! Broiled Again! The Hottest Urban Legends Going</i>	GR 105 .B688
398.2097 P	<i>Pissing in the Snow &amp; Other Ozark Folktales</i>	GR 110 .M77 P57
398.307 B	<i>The Study of American Folklore</i>	GR 105 .B7
398.21 Mac	<i>Tales Until Dawn; The World of A Cape Breton Gaelic Story-Teller</i>	GR 113.5 .C36 M35

**FIGURE 1-3**

A typical shelf of books arranged by LC call number



## The U.S. Superintendent of Documents (SuDocs) Classification System

There is another classification system used in many libraries that is almost but not quite a subject-based system. It is the U.S. Superintendent of Documents (SuDocs) Classification System. SuDocs numbers perform the same task that LC call numbers do: they group documents together on the shelves, but they do it by Cabinet-level agency rather

than by subject: Education, Labor, Environment, Treasury, are a few agencies represented in the system.

The agencies work almost as a subject system because many of the documents produced by an agency will be about the subject that the agency is named. For example, most of the documents from the Department of Education are clearly about educational issues. Those that don't appear to be directly related to education are usually about a subject that does relate to the department in a less apparent way. It is reasonable for educators to be concerned with issues of child abuse, for example, so this may be a subject covered in a Department of Education document.

Figure 1-4 provides the SuDocs numbers, issuing agencies and titles for several government documents.

Once you've learned the location of your library's government documents, you've discovered another avenue that may well lead to extremely helpful information when explored.

The LC system, and to a lesser extent, the Superintendent of Documents system, rely on content to arrange information materials by subject. *Content* can also refer to the information characteristics that vary among information materials.

## Information Characteristics

Do you need **analytical** information or **factual** information, **subjective** or **objective** information, **primary** or **secondary** information? You may never have asked yourself these questions in exactly these words but the answers to them affect your information research. You already unconsciously know the difference between objective or subjective, and analytical or factual information. You demonstrate this knowledge by not taking out a book on pizza but rather asking a friend for her review of the local pizza places, by not checking out whole books but rather looking in the Reference Collection of a library when you need only a definition or a statistic, or by not asking your roommate's opinion but rather looking for a few recent and specific periodical articles when you have to do a persuasive speech and provide evidence to support your view of your topic. But if you *consciously* make a decision about what you need, you go to the right place first. You *begin* by looking for the information characteristic(s) you need.

**FIGURE 1-4**

Examples of documents numbered using the Superintendent of Documents (SuDocs) classification system

SuDocs Number (Agency in parentheses)	Document Title
C 3.186: P-70/2/NO.30 (Dept. of Commerce, Economics and Statistics Administration, Bureau of the Census)	Who's Minding the Kids?: Child Care Arrangements, Fall 1988
HE 20.3702: C44/10 (Dept. of Health and Human Services)	Comparative Study of Traditional and Modern Medicine in Chinese Societies
PE 1.10/8: H34 (Peace Corps)	Health, Population, and Nutrition Systems in LDC's: A Handbook
SBA 1.32/2: MP 29 (Small Business Administration)	How to Start a Quality Child Care Business
Y 3.Ed 8/9: 2 P 92 (Intergovernmental Advisory Council on Education, United States Dept. of Education)	A report to the President of the United States : national networking conference topic : the absent parent: Washington, D.C., May 9-10, 1988
Y 4.J 89/2: S.hrg.102-649 (U.S. Congress. Senate. Committee on the Judiciary)	Protecting children in day care: building a national background check system : hearing before the Committee on the Judiciary, United States Senate, One Hundred Second Congress, first session, on the National Child Protection Act of 1991, November 12, 1991

*“Just the facts, ma’am,” as Detective Joe Friday would say.*

### Factual or Analytical

Factual information is made up of facts, and a fact is “the statement of a thing done or existing,” according to the *American Heritage Dictionary*. Factual information can provide answers to questions such as, “What’s today’s date?” or “Who won the Pulitzer Prize for Fiction in

**Who's Who in American Art and the Dictionary of Economics are examples of factual sources.**

1997?" or "What were the main characters' names in that play by Beth Henley?" A purely factual information source provides no explanation of its statements, just as a purely factual question often requires only a short, non-explanatory answer from a friend or a quick look-up in a fact source. The federal government publishes many documents that fall into this category, as do numerous other publishers.

When you decide that you need factual information only you're most likely to seek short-answer sources. These sources include dictionaries, atlases, handbooks, and directories, and usually will be found in a library's Reference Room or Reference Collection. Reference sources are kept separate from the other books in a library because their content makes them most useful in a quick-look-up way. For example, you wouldn't check out a book such as *International Marketing Data and Statistics* for four weeks when you can open it to one page and see the table that lists the number of cinema screens and cinema revenue per country. You'll find this book in a Reference Room. Nor should you have to read the *Dictionary of Concepts in General Psychology* from cover to cover to discover Freud's place in psychology. Rather you'll use the book briefly in the Reference Room to get that information.

**Background sources, such as encyclopedias, provide factual information within a context, and are excellent places to begin research on a topic that's new to you.**

Some reference sources include factual information that has been put into a broader context. Encyclopedias and some handbooks comprise this type of source. An example is the *Oxford Companion to the Mind*. Such background sources are designed to provide fairly short answers to questions and to give you a general overview of a subject. They are still not the type of in-depth analysis that you need to take home for an extended loan so they are grouped (organized) with other similar sources, most often in a Reference Room. If you know nothing about a topic that you have to research for a class, does it make sense to start your search by looking in a computer index for periodical articles? Not usually, because periodical articles are often narrowly focused on one aspect of a topic and you do not yet know what all the aspects are. You need an overview of your topic, the kind of basic explanation that's found in an encyclopedia.

However, when you know that you need to do your own analysis of a topic, you seldom look only in the Reference Room for your information sources. You look in a different place for in-depth, analytical information to help you.

**Analytical information** is an interpretation of facts. It's the information provided by your professor when she explains the meaning of a paragraph in your philosophy text, or the discussion you find in several periodical articles that examine the implications of the genocide committed in Rwanda by the Hutu and the Tutsi peoples. Analytical information includes interpretations and analyses of facts, usually by experts.

*Analytical information is found in books and periodical articles.*

A search for analytical information may begin but cannot be completed in the Reference Collection of a library. Such a search requires information, from periodical articles and books and perhaps government documents, that discusses the interrelations among, implications of, and reasons behind actions, ideas, works of art, and events. Usually it takes more than one source to provide a thorough analysis of a topic so you as a researcher will have to find a system that groups items of the same subject together. Your familiarity with the LC system will help you find books grouped together on a topic. If you know of a government agency that is interested in your topic you know that you'll find that agency's documents grouped together in the SuDocs system. Not all information materials are physically grouped together by subject, but the content of those materials is organized through indexing systems. The chapters in this text entitled "Making the Systems Work" and "The Research Process" will help you learn to search by subject for books or periodical articles or government documents or Internet sources.

### Objective or Subjective

*An editorial provides subjective information.*

Another characteristic of information is its subjectivity or objectivity. Opinions or personal viewpoints and usually some facts comprise subjective information, while non-judgmental and balanced reporting should be found in objective information. An example of the difference between subjective and objective information sources might be your friend's opinion of the Baha'i faith (subjective source) and a list of the tenets of that religion found in the *Encyclopedia of Religion* (objective source). When do you need one and when should you seek the other?

**Objective information** should present all sides of a topic. It usually includes basic facts within a clear context that provides you with a sense of the whole topic. Objective information often enables you to choose a single aspect of a topic that will be manageable for your research. Many encyclopedias provide just this type of help.



*Often subjective information and objective information appear in the same source.*

**Subjective information** is helpful once you know what you're looking for. This property of information refers to the opinions expressed on a topic. These opinions can range from a classmate's evaluation of your professor to a reviewer's column about a recent book to a scientist's comments about a colleague's research findings to an editorial in a newspaper or journal. Subjective information often provides assistance when your job is to evaluate a subject. Most subjective information is found in books and periodical articles.

### Primary or Secondary

Sometimes you're assigned to find and analyze raw data in a research project, or to locate and use the first report of a scientific breakthrough. Other times you have a personal wish to see an on-the-scene account of an incident. These are instances of needs for primary information sources. What is primary information and how does it differ from secondary? How does this affect its place in an information system, and therefore affect your information research?

**Primary information** is information in its original form. A primary source provides information that has not been published anywhere else, or put into a context or interpreted or translated by anyone else. Examples of primary sources are people, such as the professor who tells you about what happened in the class you missed because you were ill; a newspaper account of an event written by a reporter on the scene, such as the articles about Susan Butcher winning the 1991 Iditarod sled-dog race in Alaska; a first report of a scientific study, such as the medical journal article that first reported the research that discovered the causative virus in AIDS; an original artwork; a handwritten manuscript, such as the example in Figure 1-5 A; the diary of a marathon runner published on the World Wide Web, as illustrated in Figure 1-5 B.

Primary information is a first appearance of information and much of its value as a source derives from this fact. Some primary sources are original manuscripts and letters that require special preservation techniques. These sources are very often fragile or rare and may be kept in a library's Special Collections, or in a library that is itself a special collection. Some of these fragile sources are appearing on the Web, digitized so that they can be used by many and yet not be damaged by handling. While the digitized image itself is a reprocessing of the original, you, as an undergraduate student, might be allowed to cite