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Researching Your Subject

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**IN THE WORKPLACE,** you will conduct research all the time. As a buyer for a clothing retailer, for example, you might need to conduct research to help you determine whether a new line of products would be successful in your store. As a civil engineer, you might need to perform research to determine whether to replace your company’s traditional surveying equipment with GPS-based gear. And as a pharmacist, you might need to research whether a prescribed



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medication might have a harmful interaction with another medication a patient is already taking.

In the workplace, you will conduct research using a variety of methods. You will consult websites, blogs, and discussion boards, and you might listen to podcasts or watch videos. Sometimes you will interview people, and you will likely distribute surveys electronically to acquire information from customers and suppliers. Regardless of which technique you use, your challenge will be to sort the relevant information from the irrelevant, and the accurate from the bogus.

This chapter focuses on conducting primary research and secondary research. *Primary research* involves discovering or creating technical information yourself. *Secondary research* involves finding information that other people have already discovered or created. This chapter presents secondary research first. Why?

Because you will probably do secondary research first. To design the experiments or the field research that goes into primary research, you need a thorough understanding of the information that already exists about your subject.

# Understanding the Differences Between Academic and Workplace Research

Although academic research and workplace research can overlap, in most cases they differ in their goals and their methods.

In *academic research*, your goal is to find information that will help answer a scholarly question: “What would be the effect on the trade balance between the United States and China if China lowered the value of its currency by

10 percent?” or “At what age do babies learn to focus on people’s eyes?” Aca- demic research questions are often more abstract than applied. That is, they get at the underlying principles of a phenomenon. Academic research usually requires extensive secondary research: reading scholarly literature in aca- demic journals and books. If you do primary research, as scientists do in labs, you do so only after extensive secondary research.

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In *workplace research*, your goal is to find information to help you answer a practical question: “Should we replace our sales staff’s notebook comput- ers with tablets?” or “What would be the advantages and disadvantages

to our company of adopting a European-style privacy policy for customer information?” Workplace research questions frequently focus on improving a situation at a particular organization. These questions call for considerable primary research because they require that you learn about your own orga- nization’s processes and how the people in your organization would respond to your ideas. Sometimes, workplace research questions address the needs of customers or other stakeholders. You will need a thorough understanding of your organization’s external community in order to effectively align your products or services with their needs.

Regardless of whether you are conducting academic or workplace research, the basic research methods—primary and secondary research—are fundamentally the same, as is the goal: to help you answer questions.

# Understanding the Research Process

When you perform research, you want the process to be effective and effi- cient. That is, you want to find information that answers the questions you need to answer. And you don’t want to spend any more time than necessary getting that information. To meet these goals, you have to think about how the research relates to the other aspects of the overall project. The Focus

on Process box provides an overview of the research process. Although

all these tasks are described as part of the planning stage, remember that you might also need to perform additional research during the drafting, revising, editing, and proofreading stages. Whenever you need additional information to help you make your argument clear and persuasive, do more research.

# Choosing Appropriate Research Methods

Different research questions require different research methods. Once you have determined the questions you need to answer, think about the various research techniques you could use to answer them.

For example, your research methods for finding out how a current situa- tion is expected to change would differ from your research methods for find- ing out how well a product might work for your organization. That is, if you want to know how outsourcing will change the computer-support industry over the next 10 to 20 years, you might search for long-range predictions

in journal and magazine articles and on reputable websites and blogs. By contrast, if you want to figure out whether a specific scanner will produce the quality of scan that you need and will function reliably, you might do the same kind of secondary research and then observe the operation of the scanner at a vendor’s site; schedule product demos at your site; follow up by

## FOCUS ON PROCESS

**PLANNING t Analyze your audience.** Who are your most important

readers? What are their personal characteristics, their attitudes

toward your subject, their motivations for reading? If you are writing to an expert audience that might be skeptical about your message, you need to do a lot of research to gather the evidence for a convincing argument. See Ch. 5.

**t Analyze your purpose.** Why are you writing? Understanding your purpose helps you understand the types of information readers will expect. Think in terms of what you want your readers to know or believe or do after they finish reading your document. See Ch. 5.

**t Analyze your subject.** What do you already know about your subject? What do you still need to find out? Using techniques such as freewriting and brainstorming, you can determine those aspects of the subject you need to investigate. See Ch. 3.

**t Visualize the deliverable.** What application will you need to deliver: a proposal, a report, a website? What kind of oral presentation will you need to deliver? See Ch. 3.

**t Work out a schedule and a budget for the project.** When

is the deliverable due? Do you have a budget for phone calls, database searches, or travel to libraries or other sites? See Ch. 3.

**t Determine what information will need to be part of that deliverable.** Draft an outline of the contents, focusing on the kinds of information that readers will expect to see in each part. See Ch. 3.

**t Determine what information you still need to acquire.** Make a list of the pieces of information you don’t yet have.

**t Create questions you need to answer in your deliverable.** Writing the questions in a list forces you to think carefully about your topic. One question suggests another, and soon you have a lengthy list that you need to answer.

**t Conduct secondary research.** Study journal articles and

web-based sources such as online journals, discussion boards, blogs, and podcasts.

**t Conduct primary research.** You can answer some of your questions by consulting company records, by interviewing experts in your organization, by distributing questionnaires, and by interviewing other people in your organization and industry. Other questions call for using social media to gather information from your customers, suppliers, and other stakeholders.

**t Evaluate your information.** Once you have your information, you need to evaluate its quality: is it accurate, comprehensive, unbiased, and current?

**t Do more research.** If the information you have acquired doesn’t sufficiently answer your questions, do more research.

And if you have thought of additional questions that need to be answered, do more research. When do you stop doing

research? You will stop only when you think you have enough high-quality information to create the deliverable.

interviewing others in your company; and perform an experiment in which you try two different scanners and analyze the results.

Table 6.1 provides a good starting point for thinking about how to acquire the information you need. You are likely to find that your research plan changes as you conduct your research. You might find, for instance, that you need more than one method to get the information you need or that the one method you thought would work doesn’t. Still, having a plan can help you discover the most appropriate methods more quickly and efficiently.

#### TABLE 6.1 Research Questions and Methods

|  |  |  |
| --- | --- | --- |
| **TYPE OF QUESTION** | **EXAMPLE OF QUESTION** | **APPROPRIATE RESEARCH TECHNIQUE** |
| What is the theory behind this | How do greenhouse gases | **Encyclopedias**, **handbooks**, and **journal articles** present |
| process or technique? | contribute to global warming? | theory. Also, you can find theoretical information on  **websites** of reputable professional organizations and |
|  |  | universities. Search using keywords such as “greenhouse |
|  |  | gases” and“global warming.” |
| What is the history of this | When and how did engineers | **Encyclopedias** and **handbooks** present history. Also, you |
| phenomenon? | first try to extract shale oil? | can find historical information on **websites** of reputable |
|  |  | professional organizations and universities. Search using |
|  |  | keywords such as “shale oil” and“petroleum history.” |
| What techniques are being | How are companies | If you need recent information, you will have better luck |
| used now to solve this | responding to the federal | using digital resources such as **websites** and **social media** |
| problem? | government’s new laws on | than using traditional print media. Search using keywords |
|  | health-insurance portability? | and tags such as “health-insurance portability.” Your search |
|  |  | will be most effective if you use standard terminology, such |
|  |  | as “HIPAA” for the health-insurance law. |
| How is a current situation | What changes will outsourcing | For long-range predictions, you can find information in |
| expected to change? | cause in the computer-support industry over the next 10 to  20 years? | **journal articles** and **magazine articles** and on reputable **websites**. Experts might write forecasts on **discussion boards** and **blogs**. |
| What products are available | Which vendors are available | For products and services, search **websites**, **discussion** |
| to perform a task or provide a | to upgrade and maintain our | **boards**, and **blogs**. Reputable vendors—manufacturers and |
| service? | company’s website? | service providers—have sites describing their offerings. But |
|  |  | be careful not to assume vendors’ claims are accurate. Even |
|  |  | the specifications they provide might be exaggerated. |
| What are the strengths and | Which portable GPS system is | Search for benchmarking articles from experts in the field, |
| weaknesses of competing | the lightest? | such as a **journal article** (either in print or on the web) |
| products and services? |  | about camping and outfitting that compares the available |
|  |  | GPS systems according to reasonable criteria. Also check **discussion boards** for reviews and **blogs** for opinions. If appropriate, do **field research** to answer your questions. |
| Which product or service do | Which four-wheel-drive SUV | Experts write **journal articles**, **magazine articles**, and |
| experts recommend? | offers the best combination of features and quality for our needs? | sometimes **blogs**. Often, they participate in **discussion boards**. Sometimes, you can **interview** them, in person or on the phone, or write them **inquiries**. |

(*continued*)

#### TABLE 6.1 Research Questions and Methods (*continued*)

|  |  |  |
| --- | --- | --- |
| **TYPE OF QUESTION** | **EXAMPLE OF QUESTION** | **APPROPRIATE RESEARCH TECHNIQUE** |
| What do our stakeholders think | Would the public like to see us | Study **journal** and **magazine articles** or influential **blogs** or |
| about a current or proposed | add a plug-in hybrid version | post a question on a **company blog** or on a **microblogging** |
| product or service? | to our line of small SUVs? | **site** such as Tumblr and ask for responses. Also consider |
|  | How would we market it to | analyzing social-media data, using software to capture and |
|  | distinguish it from the existing | measure keywords from social-media platforms. |
|  | hybrid small SUVs? |  |
| What are the facts about | Do our chemists use gas | Sometimes, you can **interview** someone, in person or on |
| how we do our jobs at this | chromatography in their | the phone, to answer a simple question. To determine |
| company? | analyses? | whether your chemists use a particular technique, start by |
|  |  | asking someone in the relevant department. |
| What can we learn about | What caused the | You can **interview** personnel who were closest to the |
| what caused a problem in our | contamination in the clean | problem and **inspect** the scene to determine the cause of |
| organization? | room? | the problem. |
| What do our personnel | Do our quality-control analysts | If there are only a few personnel, **interview** them. If there |
| think we should do about a | think we need to revise our | are many, use **questionnaires** to get the information more |
| situation? | sampling quotient? | quickly. |
| How well would this product | Would this scanner produce | Read product reviews on reputable **websites**. Study |
| or service work in our | the quality of scan that we | **discussion boards**. **Observe** the use of the product or |
| organization? | need and interface well with our computer equipment? | service at a vendor’s site. Schedule product **demos** at your site. Follow up by **interviewing** others in your company to get their thinking. Do an **experiment** in which you try two |
|  |  | different solutions to a problem and then analyze the results. |

**Researching a Topic**

Follow these three guidelines as you gather information to use in your document.

**Be persistent.** Don’t be discouraged if a research method doesn’t yield useful information. Even experienced researchers fail at least as often as they succeed. Be prepared to rethink how you might find the information. Don’t hesitate to ask reference librarians for help or to post questions on discussion boards.

**Record your data carefully.** Prepare the materials you will need. Write informa- tion down, on paper or electronically. Record interviews (with the respondents’ permission). Paste the URLs of the sites you visit into your notes. Bookmark sites so that you can return to them easily.

**Triangulate your research methods.** *Triangulating* your research methods means using more than one or two methods. If a manufacturer’s website says a printer produces 17 pages per minute, an independent review in a reputable journal also says 17, and you get 17 in a demo at your office with your documents, the printer probably will produce 17 pages per minute. When you need to answer important questions, don’t settle for only one or two sources.

If you are doing research for a document that will be read by people from other cultures, think about what kinds of evidence your readers will consider appropriate. In many non-Western cultures, tradition or the authority of the per- son making the claim can be extremely important, in some cases more impor- tant than the kind of scientific evidence that is favored in Western cultures.

And don’t forget that all people pay particular attention to information

that comes from their own culture. If you are writing to European readers about telemedicine, for instance, try to find information from European authorities and about European telemedicine. This information will interest your readers and will likely reflect their cultural values and expectations.

# Conducting Secondary Research

When you conduct secondary research, you are trying to learn what experts have to say about a topic. Whether that expert is a world-famous scientist revising an earlier computer model about the effects of climate change on agriculture in Europe or the head of your human-resources department checking company records to see how the Affordable Care Act changed the way your company hired part-time workers last year, your goal is the same: to acquire the best available information—the most accurate, most unbiased, most comprehensive, and most current.

Sometimes you will do research in a library, particularly if you need special- ized handbooks or access to online subscription services that are not freely available on the Internet. Sometimes you will do your research on the web. As a working professional, you might find much of the information you need in

your organization’s information center. An *information center* is an organization’s

library, a resource that collects different kinds of information critical to the orga- nization’s operations. Many large organizations have specialists who can answer research questions or who can get articles or other kinds of data for you.

### **UNDERSTANDING THE RESEARCH MEDIA**

Today, most technical information is distributed not only in print but also through digital media accessible on the Internet. You will probably use infor- mation published in four major media:

r **Print.** Books, journals, reports, and other documents will continue to be produced in print because printed documents are portable and you can write on them. For documents that do not need to be updated periodically, print remains a useful and popular medium. To find printed documents, you will use online catalogs.

r **Online databases.** Most libraries—even many public libraries—subscribe to services, such as LexisNexis, ProQuest, InfoTrac, Gale Virtual Reference, and ERIC, that provide access to large databases of journal articles, conference proceedings, newspapers, and other documents.

r **Websites.** The good news is that there are billions of pages of information on the web. The bad news is that there are billions of pages of information on the web. Still, if you search effectively and efficiently, you can find reference materials such as dictionaries and encyclopedias that don’t exist in print, online versions of magazines and journals with extra features not present in the print versions, conversion calculators and other statistical software, current survey data, animations, audio and video podcasts, and many other kinds of information.

r **Social media.** This is a broad term encompassing several kinds of media, all of which include user-generated content. A *discussion board* is an online discussion that readers contribute to by posting messages. Most discussion boards are organized by threads (sometimes called *topics*).

All of the posts on a thread are presented together, usually in reverse- chronological order. A *blog* is a web log, a web-based periodical published by a person or group, to which readers can contribute comments. A *wiki* is a document or website that users write and edit online.

### **USING TRADITIONAL RESEARCH TOOLS**

There is a tremendous amount of information in the different media. The trick is to learn how to find what you want. This section discusses six basic research tools.

**Online Catalogs** An online catalog is a database of books, microform mate- rials, films, compact discs, phonograph records, tapes, and other materials. In most cases, an online catalog lists and describes the holdings at one particular library or a group of libraries. Your college library has an online catalog of its holdings. To search for an item, consult the instructions, which explain how to limit your search by characteristics such as types of media, date of publication, and language. The instructions also explain how to use punctuation and words such as *and*, *or*, and *not* to focus your search effectively.

**Reference Works** Reference works include general dictionaries and ency- clopedias, biographical dictionaries, almanacs, atlases, and dozens of other research tools. These print and online works are especially useful when you are beginning a research project because they provide an overview of the subject and often list the major works in the field.

How do you know if there is a dictionary of the terms used in a given field?

The following reference books—the guides to the guides—list some of the many resources available:

Hacker, D., and Fister, B. *Research and documentation online* (5th ed.). [http://](http://dianahacker.com/resdoc) [dianahacker.com/resdoc](http://dianahacker.com/resdoc)

Kennedy, X. J., Kennedy, D. M., and Muth, M. F. (2014). *The Bedford guide for college writers with reader, research manual, and handbook* (10th ed.). Boston: Bedford/St. Martin’s.

Lester, R. (Ed.). (2008). *The new Walford guide to reference resources* (Vol. 1: Science, Technology and Medicine; Vol. 2: Social Sciences). London: Neal-Schuman.

Palmquist, M. *The Bedford researcher.* [http://bcs.bedfordstmartins.com](http://bcs.bedfordstmartins.com/bedfordresearcher/links/disciplines-art.asp)

[/bedfordresearcher/links/disciplines-art.asp](http://bcs.bedfordstmartins.com/bedfordresearcher/links/disciplines-art.asp)

To find information on the web, go to the “reference” section of a library website or search engine. There you will find links to excellent collections of reference works online, such as Infomine and ipl2*.*

**Periodical Indexes** Periodicals are excellent sources of information because they offer recent, authoritative discussions of specific subjects. The biggest challenge in using periodicals is identifying and locating the dozens of articles relevant to any particular subject that are published each month. Although only half a dozen major journals might concentrate on your field, a useful article could appear in one of hundreds of other publications. A

periodical index, which is a list of articles classified according to title, subject, and author, can help you determine which journals you want to locate.

There are periodical indexes in all fields. The following brief list will give you a sense of the diversity of titles:

r "Q*plied Science & Technology Index*

r *Business Source Premier*

r *Engineering Village*

r *Readers’ Guide to Periodical Literature*

You can also use a directory search engine. Many directory categories include a subcategory called “journals” or “periodicals” listing online and printed sources.

Once you have created a bibliography of printed articles you want to study, you have to find them. Check your library’s online catalog, which includes all the journals your library receives. If your library does not have an article you want, you can use one of two techniques for securing it:

r **Interlibrary loan.** Your library finds a library that has the article. That library scans the article and sends it to your library. This service can take more than a week.

r **Document-delivery service.** If you are in a hurry, you can log on to a document-delivery service, such as IngentaConnect, a free database of 6 million articles in 12 thousand periodicals. There are also fee-based document-delivery services.

**Newspaper Indexes** Many major newspapers around the world are indexed by subject. The three most important indexed U.S. newspapers are the following:

r UIF *New York Times*, perhaps the most reputable U.S. newspaper for national and international news

r UIF *Christian Science Monitor*, another highly regarded general newspaper

r UIF *Wall Street Journal*, the most authoritative news source on business,

finance, and the economy

Many newspapers available on the web can be searched electronically, although sometimes there is a charge for archived articles. Keep in mind that the print version and the electronic version of a newspaper can vary greatly. If you wish to quote from an article in a newspaper, the print version is the preferred one.

**Abstract Services** Abstract services are like indexes but also provide abstracts: brief technical summaries of the articles. In most cases, reading the abstract will enable you to decide whether to seek out the full article. The title of an article alone can often mislead you about its contents.

Some abstract services, such as *Chemical Abstracts Service*, cover a broad field, but many are specialized rather than general. *Fuente Académica*, for instance, focuses on Basque studies. Figure 6.1 shows an abstract from *AnthroSource,* an abstract service covering anthropology journals*.*

**Government Information** The U.S. government is the world’s biggest publisher. In researching any field of science, engineering, or business, you are likely to find that a federal agency or department has produced a relevant brochure, report, or book.

Government publications are cataloged and shelved separately from other kinds of materials. They are classified according to the Superintendent of Documents system, not the Library of Congress system. A reference librar- ian or a government documents specialist at your library can help you use government publications.

*For more about abstracts, see Ch. 18, p. 479.*

**PLOT AND IRONY IN CHILDBIRTH NARRATIVES OF MIDDLE-CLASS BRAZILIAN WOMEN**

Brazil’s rate of cesarean deliveries is among the highest in the world and constitutes the majority of childbirths in private hospitals. This study examines ways middle-class Brazilian women are exercising agency in this context. It draws from sociolinguistics to examine narrative structure and dramatic properties of 120 childbirth narratives of 68 low- to high-income women. Surgical delivery constituted 62% of the total. I focus on 20 young middle-class women, of whom 17 had C-sections. Doctors determined mode of childbirth pre-emptively or appeared to accommodate women’s wishes, while framing the scenario as necessitating surgical delivery. The

women strove to imbue C-section deliveries with value and meaning through staging, filming, familial presence, attempting induced labor, or humanized childbirth. Their stories indicate that class privilege does not lead to choice over childbirth mode. The women nonetheless struggle over the significance of their agency in childbirth.

**FIGURE 6.1 An Abstract from *AnthroSource***

*Source:* Abstract from Maureen O’Dougherty, “Plot and Irony in Childbirth Narratives of Middle-Class Brazilian Women,” *Medi- cal Anthropology Quarterly,* Volume 27, Issue 1, pages 43–62, March 2013. © 2013 by the American Anthropological Associa- tion. Reprinted by permission of John Wiley & Sons, Inc.

*For more about RFPs, see Ch. 16, p. 422.*

To watch a tutorial on using online tools to organize your

research, go to Ch. 6 > Additional Resources > Tutorials: [**macmillanhighered.com**](http://macmillanhighered.com/launchpad/techcomm11e)

[**/launchpad/techcomm11e**](http://macmillanhighered.com/launchpad/techcomm11e).

You can also access various government sites and databases on the Inter- net. For example, if your company wishes to respond to a request for propos- als (RFP) published by a federal government agency, you will find that RFP on a government site. The major entry point for federal government sites is [USA](http://usa.gov/)

[.gov (usa.go](http://usa.gov/)v), which links to hundreds of millions of pages of government information and services. It also features tutorials, a topical index, online transactions, and links to state and local government sites.

### **USING SOCIAL MEDIA AND OTHER INTERACTIVE RESOURCES**

Social media and other interactive resources enable people to collaborate, share, link, and generate content in ways that traditional websites offering static content cannot. The result is an Internet that can harness the collec- tive intelligence of people around the globe—and do so quickly. However, the ease and speed with which new content can be posted, as well as the lack of formal review of the content, creates challenges for people who do research on the Internet. Everyone using social-media resources must be extra cau- tious in evaluating and documenting sources.

This discussion covers three categories of social media and web-based resources used by researchers—discussion boards, wikis, and blogs—as well as two techniques for streamlining the process of using these resources: tagged content and RSS.

**Discussion Boards** Discussion boards, online discussion forums spon- sored by professional organizations, private companies, and others, enable researchers to tap a community’s information. Discussion boards are espe- cially useful for presenting quick, practical advice. However, the advice might or might not be authoritative. Figure 6.2 shows one interchange related to starting a business as a foreign national.

**Wikis** A wiki is a website that makes it easy for members of a community, company, or organization to create and edit content collaboratively. Often, a wiki contains articles, information about student and professional confer- ences, reading lists, annotated sets of links, book reviews, and documents used by members of the community. You might have participated in creating and maintaining a wiki in one of your courses or as a member of a commu- nity group outside of your college.

Wikis are popular with researchers because they contain information that can change from day to day, on topics in fields such as medicine or business. In addition, because wikis rely on information contributed voluntarily by mem- bers of a community, they represent a much broader spectrum of viewpoints than media that publish only information that has been approved by editors. For this reason, however, you should be especially careful when you use wikis; the information they contain might not be trustworthy. It’s a good idea to cor- roborate any information you find on a wiki by consulting other sources.

An excellent example of how organizations use wikis is provided by the fed- eral government’s Mobile Gov, a set of wikis whose purpose is to make “any-

*Search Community*

Hello, I am interested to open a branch of my company in US and before contacting professional that could assist me I would like to have a general idea on the steps and requirements that I must fulfill. I saw from older posts that there was a blog available with those infos but it seems the link it does not work anymore. Any suggestion is very helpfull!

*This comment was removed from public view (Spam). Please review the Community Rules of Conduct for more information.*

**FIGURE 6.2 A Discus-**

**sion Board Exchange**



*Source:* Small Business Administration, 2014: [http://www.sba.gov/community](http://www.sba.gov/community/discussion-boards/starting-business-us-foreign-national)

[/discussion-boards/starting-business](http://www.sba.gov/community/discussion-boards/starting-business-us-foreign-national)

[-us-foreign-national](http://www.sba.gov/community/discussion-boards/starting-business-us-foreign-national).

If you use a search engine to find this interchange, you are perform- ing secondary research: discovering what has already been written

or said about a topic. If you post a question to a discussion board (or comment on a blog post) and someone responds, you are per-

forming primary research, just as if you were interviewing that person. For more on primary research, see

p. 130. But don’t worry too much about whether you are doing pri- mary or secondary research; worry about whether the information is accurate and useful.

Moderators who oversee discussion boards routinely delete comments from trolls advertising weight-loss solutions and other scams.

time, anywhere, any-device government services and info” available to other government agencies, businesses, and the general public. These wikis enable all these stakeholders to contribute technical information and advice about how to help government agencies make their services available from mobile devices. A recent post by the World Wide Web Consortium (W3C), the stan- dards agency for the web, explained that the barriers to using websites on a mobile device are similar to the barriers faced by people with disabilities when they try to use websites on any device. The post by W3C included detailed recommendations and links to information that can help developers make the transition to responsive web design. In other words, the wiki provided a forum for experts on web accessibility to help federal agencies provide services.

How do you search wikis? You can use any search engine and add the word “wiki” to the search. Or you can use a specialized search engine such as [Wiki.com.](http://www.Wiki.com/)

**Blogs** Many technical and scientific organizations, universities, and private companies sponsor blogs that offer useful information for researchers.

Keep in mind that bloggers are not always independent voices. A Hewlett- Packard employee writing on a company-sponsored blog will likely be pre-

*For more about blogs, see Ch. 14, p. 377.*



**FIGURE 6.3 A Blog**

*In the first ten days after it went online, this post was liked 522 times on Facebook, was tweeted 86 times on Twitter, and elicited 11 comments from readers. Almost all blogs invite readers to post comments or questions. Source:* NASA, 2013: <http://climate.nasa.gov/blog/938>. Illustration reprinted by permission of John Cook.

senting the company’s viewpoint on the topic. Don’t count on that blogger to offer objective views about products.

Figure 6.3, a screenshot of a portion of NASA’s My Big Fat Planet blog, offers information that is likely to be credible, accurate, and timely.

**Tagged Content** Tags are descriptive keywords people use to categorize and label content such as blog entries, videos, podcasts, and images they post to the Internet or bookmarks they post to social-bookmarking sites. Tags can be one-word descriptors without spaces or punctuation (such as “sandiegozoo”) or multiword descriptors (such as “San Diego Zoo”). More and more social- media platforms, including Facebook, have adopted the hashtag (#) as a way to tag an item to make it easier to find by searching.

Figure 6.4 shows search results for blogs tagged with “Google Glass” on Technorati, a site that currently tracks more than a hundred million blogs and a quarter billion pieces of tagged social media.

**RSS Feeds** Repeatedly checking for new content on many different websites can be a time-consuming and haphazard way to research a topic.



**FIGURE 6.4 Search Results for Blogs Tagged with “Google Glass”**

*This search returned 10 blogs that relate to the topic of Google Glass. Readers could also search for individual posts about the topic on other social media and get even more responses. The Technorati Authority figure, which is abbreviated as “Auth” on the right, measures how many other sites refer to the blog, reflecting its popularity.*

*Source:* Technorati, 2013: [www.technorati.com](http://www.technorati.com/). Reprinted by permission of Technorati Media.

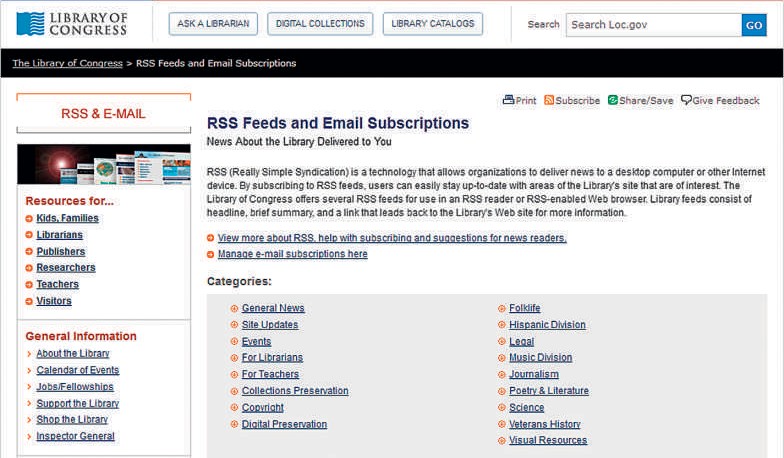
*RSS* (short for *rich site summary* or *really simple syndication*) *technology* allows readers to check just one place (such as a software program running on their computer or an email program) for alerts to new content posted on selected websites. Figure 6.5 shows a website that offers RSS feeds. Readers use a special type of software program called an *RSS aggregator* to be alerted by *RSS feeds* (notifications of new or changed content from sites of interest to them).

### **EVALUATING THE INFORMATION**

You’ve taken notes, paraphrased, and quoted from your secondary research. Now, with more information than you can possibly use, you try to figure out what it all means. You realize that you still have some questions—that some of the information is incomplete, some contradictory, and some unclear.

There is no shortage of information; the challenge is to find information that

*For more about taking notes, paraphrasing, and quoting, see Appendix, Part A, p. 606.*



**FIGURE 6.5 A Website Offering RSS Feeds**

*This page shows how to use RSS feeds on the Library of Congress website.*

*Source:* Library of Congress, 2013: [www.loc.gov/rss/](http://www.loc.gov/rss/).

is accurate, unbiased, comprehensive, appropriately technical, current, and clear.

r **Accurate.** Suppose you are researching whether your company should consider flextime scheduling. If you estimate the number of employees who would be interested in flextime to be 500 but it is in fact closer to 50, inaccurate information will cause you to waste time doing an unnecessary study.

r **Unbiased.** You want sources that have no financial stake in your project. A private company that transports workers in vans is likely to be a biased source because it could profit from flextime, making extra trips to bring employees to work at different times.

r **Comprehensive.** You want information from different kinds of people— in terms of gender, cultural characteristics, and age—and from people representing all viewpoints on the topic.

r **Appropriately technical.** Good information is sufficiently detailed to respond to the needs of your readers, but not so detailed that they cannot understand it or do not need it. For the flextime study, you need to find out whether opening your building an hour earlier and closing it an hour later would significantly affect your utility costs. You can get this information by interviewing people in the Operations Department; you do not need to do a detailed inspection of all the utility records of the company.

r **Current.** If your information is 10 years old, it might not accurately reflect today’s situation.

r **Clear.** You want information that is easy to understand. Otherwise, you’ll waste time figuring it out, and you might misinterpret it.

The most difficult kind of material to evaluate is user-generated content from the Internet—such as information on discussion boards or in blogs— because it rarely undergoes the formal review procedure used for books and professional journals. A general principle for using any information you find on the Internet is to be extremely careful. Because content is unlikely to have been reviewed before being published on a social-media site, use one or more

**Evaluating Print and Online Sources**

**FOR PRINTED SOURCES FOR ONLINE SOURCES**

**Authorship**

Do you recognize the name of the author? Does the source describe the author’s credentials and current position? If not, can you find this information in a “who’s who” or by searching for other books or other journal articles by the author?

**Publisher**

What is the publisher’s reputation? A reliable book is published by a repu- table trade, academic, or scholarly publisher; a reliable journal is spon- sored by a professional association or university. Are the editorial board members well known?

Trade publications—magazines about a particular industry or group—often promote the interests of that industry or group. For example, information in a trade publication for either loggers or environmentalists might be biased. If you doubt the authority of a book or journal, ask a reference librarian or a professor.

If you do not recognize the author’s name, is the site mentioned on another reputable site? Does the site contain links to other reputable sites? Does it contain biographical information—

the author’s current position and cre- dentials? Can you use a search engine to find other references to the author’s credentials? Be especially careful with unedited sources such as Wikipedia; some articles in it are authoritative, others are not. Be careful, too, with blogs, some of which are written by disgruntled former employees with a score to settle.

Can you determine the publisher’s identity from headers or footers? Is the publisher reputable?

If the site comes from a personal ac- count, the information it offers might be outside the author’s field of expertise. Many Internet sites exist largely for pub- lic relations or advertising. For instance, websites of corporations and other orga- nizations are unlikely to contain self-crit- ical information. For blogs, examine the *blogroll*, a list of links to other blogs and websites. Credible blogs are likely to link to blogs already known to be credible. If a blog links only to the author’s friends, blogs hosted by the same corporation, or blogs that express the same beliefs, be very cautious.

(*continued*)

**Timeliness**

Does the document rely on recent Was the document created recently? data? Was the document published Was it updated recently? If a site is not recently? yet complete, be wary.

Is the site well constructed? Is the information well written? Is it based on reasonable assumptions? Are the claims supported by appropriate evidence? Has the author used sound reasoning? Has the author explained the limitations of the information? Are sources cited? On- line services such as BlogPulse help you evaluate how active a blog is, how the blog ranks compared to other blogs, and who is citing the blog. Active, influential blogs that are frequently linked to and cited by others are more likely to contain accurate, verifiable information.

Analyze the Internet source as you would any other source. Often, refer- ences to other sources will take the form of links.

**Accuracy and verifiability of the information**

Is the information based on reason- able assumptions? Does the author clearly describe the methods and theories used in producing the in- formation, and are they appropriate to the subject? Has the author used sound reasoning? Has the author explained the limitations of the information?

**FOR ONLINE SOURCES**

**FOR PRINTED SOURCES**

**Knowledge of the literature** Does the author appear to be knowledgeable about the major literature on the topic? Is there

a bibliography? Are there notes throughout the document?

trusted sources to confirm the information you locate. Some instructors do not allow their students to use blogs or wikis, including Wikipedia, for their research. Check with your instructor to learn his or her policies.

# Conducting Primary Research

Although the library and the Internet offer a wealth of authoritative infor- mation, in the workplace you will often need to conduct primary research because you need new information. There are eight major categories of primary research: analysis of social-media data, observations and demon- strations, inspections, experiments, field research, interviews, inquiries, and questionnaires.

### **ANALYSIS OF SOCIAL-MEDIA DATA**

Every hour, people post about 30 million comments, about 7 million photos, and some 453 years of video footage on social media (McCaney, 2013). A tor- rent of information is continuously coming online, and many organizations are working hard to sift through it to find useful insights.

**Conducting Primary Research**

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6

**DOCUMENT ANA LYSIS ACTIVITY**

**Evaluating Information from Internet Sources**

***How can you ignore thousands of scientists who say manmade global warming is a serious threat?***

The idea that there is a “scientific consensus” does not hold up. Scientists who are skeptical about“dangerous manmade climate change” have been speaking out for years. Just this year, two prominent former believers in man-made global warming announced they were reconsidering the science.

“Gaia” scientist James Lovelock had been“alarmist” about climate change for years. Now he says “The problem is we don’t know what the climate is doing. We thought we knew 20 years ago.”

German meteorologist Klaus-Eckart Puls also reversed his belief in man-made global warming in 2012 and called the idea CO2 can regulate climate “sheer absurdity.”“Ten years ago I simply parroted what the IPCC told us,” he said. “One day I started checking the facts and data. First I started with a sense of doubt, but then I became outraged when I discovered that much of what the IPCC and media were telling us was sheer nonsense and was not even supported by any scientific facts and measurements. To this day, I still feel shame that as a scientist I made presentations of their science without first checking it.”

In 2010, a report documented that More Than 1000 International Scientists Dissented Over Man-Made Global Warming Claims. Many of them were former IPCC scientists. Climate scientist Mike Hulme dismantled the “thousands

of scientists agree” claim put forth by the United Nations and news media. Claims that “2,500 of the world’s leading scientists have reached a consensus that human activities are having a significant influence on the climate” are disingenuous, Hulme noted. The key scientific case for CO2 driving global warming, like many others in the IPCC reports, “is reached by only a few dozen experts in the specific field of detection and attribution studies; other IPCC authors are experts in other fields.” Other scientists are excluded or not consulted.

Dr. William Schlesinger agrees with the UN climate view but has admitted that only 20% of UN IPCC scientists deal with climate. In other words, 80% of the UN’s IPCC membership are experts in other fields and have no dealing with or expertise in climate change as part of their academic studies.

This blog post appears in the FAQ section of the Climate Change Truth File section of the website of the Committee for a Constructive Tomorrow. (For another view on climate change, see Figure 6.3 on

p. 126.) The questions below ask you to consider the guidelines for evaluating Internet sources (pp. 129–30).

1. This portion of the site is called “Climate Change Truth File.” Does this title make you more likely or less likely to consider the information authoritative?
2. If you were considering using this source in a docu- ment you were writing, what information would you want to discover about the site and the organization that publishes it? How would you locate it?
3. The bulk of this passage is devoted to two prominent scientists who have changed their minds on the question of whether human-caused global warming is a serious threat. If the claim about the two scientists is true, does the case for human-caused global warming collapse?

*Source:* Committee for a Constructive Tomorrow, 2013: [www.cfact.org/issues/climate-change/climate-change-truth-file/](http://www.cfact.org/issues/climate-change/climate-change-truth-file/). Reprinted by permission of Committee for a Constructive Tomorrow, [www.CFACT.org](http://www.CFACT.org/).

Businesses are spending the most time on social-media research, try- ing to figure out what customers like and dislike about their products and services, learn what they want, and reinforce brand loyalty. Take the case of Nielsen, which for fifty years has been monitoring the TV viewing habits of

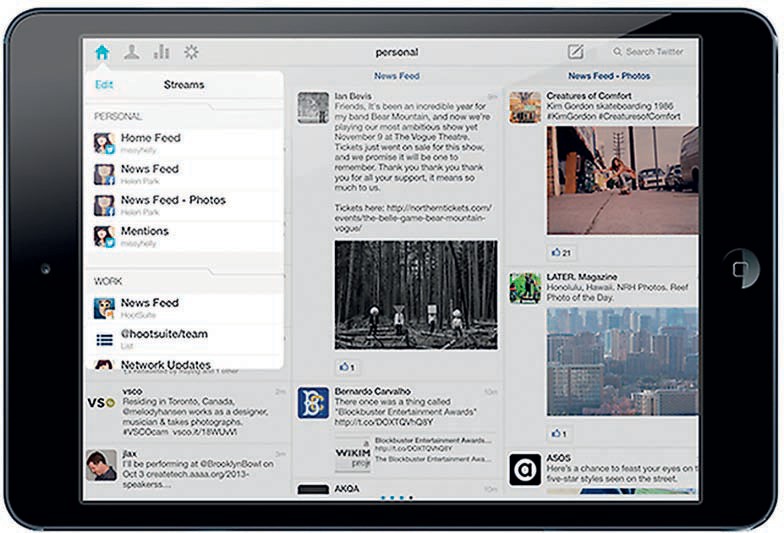
Americans by distributing questionnaires and attaching devices to their TVs, and then selling the data it collects to TV networks and producers, who use the information to determine how much to charge advertisers. The problem at Nielsen is that many people don’t watch TV on TV or they don’t watch shows when they are broadcast. Now Nielsen also uses social-media analy- sis: gathering data by monitoring social media to listen in on what people are saying on Twitter, Facebook, and other services about different TV programs (DeVault, 2013).

But organizations other than businesses are analyzing social-media data, too. For instance, the U.S. Geological Survey created the Twitter Earthquake Detector (TED), a program to monitor Twitter for the use of the word *earth- quake*. Why? Because they realized that when people experience earth- quakes, a lot of them tweet about it. The Centers for Disease Control, a U.S. federal agency, analyzes keywords on social media to monitor the spread

of diseases, such as the H7N9 flu virus, in the United States and around the world. According to one scientist, “The world is equipped with human sensors—more than 7 billion and counting. It’s by far the most extensive sensor network on the planet. What can we learn by paying attention?” (McCaney, 2013).

One more example: in 2008, an article in a medical journal suggested that lithium might slow down the progression of ALS, a condition sometimes called Lou Gehrig’s Disease. But the study reported on only a small number of patients with ALS. When other people with ALS heard about the article, they suggested gathering data from people with ALS across the country. Some 596 patients volunteered: some who were already using lithium, some who were not, and some who started using it (with the approval of their doctors). Although stud- ies such as this do not replace controlled double-blind experiments (in which neither the patients nor the researchers know whether the patients received the therapy), they are much faster and cheaper, and they can help researchers determine how to use their limited experimental resources wisely. According to the director of the ALS study, “sometimes the alternative is not our way or the old way. It is our way or it is not studied at all” (Marcus, 2011).

How do you perform social-media data analysis? There are many soft- ware programs that can help you devise searches. Among the most popular is HootSuite, which includes tools for listening in on what people are saying about your company on social media such as Twitter, Facebook, LinkedIn, and many other services. In addition, HootSuite helps you monitor and manage your company’s social-media presence and provides analytics: demographic data about who is following your company, their attitudes, and their behav- iors. Figure 6.6 shows a HootSuite dashboard, the screen that lets you view and manage all the information.



Like other similar tools for manag- ing social media, HootSuite enables you to keep your personal and busi- ness social media separate. Here we see a portion of a person’s personal social-media feed.

You set up“streams,” which are filters that enable you to see only those tweets and other media that meet certain criteria. For instance, “News Feed” filters out everything that is not news.“News Feed— Photos” shows only news items that include photos.“Mentions” shows only those items in which you are mentioned.

**FIGURE 6.6 A HootSuite Dashboard**

Courtesy of HootSuite.

### **OBSERVATIONS AND DEMONSTRATIONS**

Observation and demonstration are two common forms of primary research. When you *observe*, you simply watch some activity to understand some aspect of it. For instance, if you were trying to determine whether the loca- tion of the break room was interfering with work on the factory floor, you could observe the situation, preferably at different times of the day and on different days of the week. If you saw workers distracted by people moving in and out of the room or by sounds made in the room, you would record your observations by taking notes, taking photos, or shooting video of events. An observation might lead to other forms of primary research. You might,

for example, follow up by interviewing some employees who could help you understand what you observed.

When you witness a *demonstration* (or *demo*), you are watching someone carry out a process. For instance, if your company was considering buying a mail-sorting machine, you could arrange to visit a manufacturer’s facility, where technicians would show how the machine works. If your company

was considering a portable machine, such as a laptop computer, manufactur- ers or dealers could demo their products at your facility.

When you plan to observe a situation or witness a demo, prepare before- hand. Write down the questions you need answered or the factors you want to investigate. Prepare interview questions in case you have a chance to speak with someone. Think about how you are going to incorporate the infor- mation you acquire into the document you will write. Finally, bring whatever equipment you will need (pen and paper, computer, camera, etc.) to the site of the observation or demo.

### **INSPECTIONS**

Inspections are like observations, but you participate more actively. For exam- ple, a civil engineer can determine what caused a crack in a foundation by inspecting the site: walking around, looking at the crack, photographing it and the surrounding scene, examining the soil. An accountant can determine the financial health of an organization by inspecting its financial records, perhaps performing calculations and comparing the data she finds with other data.

These professionals are applying their knowledge and professional judg- ment as they inspect a site, an object, or a document. Sometimes inspection techniques are more complicated. A civil engineer inspecting foundation cracking might want to test his hunches by bringing soil samples back to the lab for analysis.

When you carry out an inspection, do your homework beforehand. Think about how you will use the data in your document: will you need photo- graphs or video files or computer data? Then prepare the materials and equipment you’ll need to capture the data.

### **EXPERIMENTS**

Learning to conduct the many kinds of experiments used in a particular field can take months or even years. This discussion is a brief introduction. In many cases, conducting an experiment involves four phases.

Establishing a hypothesis

Testing the hypothesis

Analyzing the data

Reporting the data

r **Establishing a hypothesis.** A hypothesis is an informed guess about the relationship between two factors. In a study relating gasoline octane and miles per gallon, a hypothesis might be that a car will get 5 percent better mileage with 89-octane gas than with 87-octane gas.

**r Testing the hypothesis.** Usually, you need an experimental group and a control group. These two groups should be identical except for the condition you are studying: in the above example, the gasoline. The

control group would be a car running on 87 octane. The experimental group would be an identical car running on 89 octane. The experiment

would consist of driving the two cars over an identical course at the same speed—preferably in some sort of controlled environment—over a given distance, such as 1,000 miles. Then you would calculate the miles per gallon. The results would either support or refute your original hypothesis.

r **Analyzing the data.** Do your data show a correlation—one factor changing along with another—or a causal relationship? For example, we know that sports cars are involved in more fatal accidents than sedans (there is a stronger correlation for sports cars), but we don’t know what the causal relationship is—whether the car or the way it is driven is the important factor.

r **Reporting the data.** When researchers report their findings, they explain what they did, why they did it, what they saw, what it means, and what ought to be done next.

### **FIELD RESEARCH**

Whereas an experiment yields quantitative data that typically can be measured precisely, most field research is qualitative; that is, it yields data that typically cannot be measured precisely. Often in field research, you seek to understand the quality of an experience. For instance, you might want to understand how

a new seating arrangement affects group dynamics in a classroom. You could design a study in which you observed and shot video of classes and interviewed the students and the instructor about their reactions to the new arrangement. Then you could do the same in a traditional classroom and compare the results.

Some kinds of studies have both quantitative and qualitative elements.

In the case of classroom seating arrangements, you could include some quantitative measures, such as the number of times students talked with one another. You could also distribute questionnaires to elicit ratings by the students and the instructor. If you used these same quantitative measures on enough classrooms, you could gather valid quantitative information.

When you are doing quantitative or qualitative studies on the behavior of animals—from rats to monkeys to people—try to minimize two common problems:

r **The effect of the experiment on the behavior you are studying.** In studying the effects of the classroom seating arrangement, minimize the effects of your own presence. For instance, if you observe in person, avoid drawing attention to yourself. Also, make sure that the video camera is placed unobtrusively and that it is set up before the students arrive, so they don’t see the process. Still, any time you bring in a camera, you cannot be sure that what you witness is typical.

r **Bias in the recording and analysis of the data.** Bias can occur because researchers want to confirm their hypotheses. In an experiment to determine whether students write differently on physical keyboards than on touch screens, a researcher might see differences where other people don’t. For this reason, the experiment should be designed so that it is *double blind.* That is, the students shouldn’t know what the experiment is about so that they don’t change their behavior to support or negate the hypothesis,

*For more about reports, see Chs. 17–19.*

and the data being analyzed should be disguised so that researchers don’t know whether they are examining the results from the control group or the experimental group. For example, the documents produced on keyboards and touch screens should be printed out the same way.

Conducting an experiment or field research is relatively simple; the hard part is designing your study so that it accurately measures what you want it to measure.

### **INTERVIEWS**

Interviews are extremely useful when you need information on subjects that are too new to have been discussed in the professional literature or are too narrow for widespread publication (such as local political questions).

In choosing a respondent—a person to interview—answer three questions:

r **What questions do you want to answer?** Only when you know this can you begin to search for a person who can provide the information.

r **Who could provide this information?** The ideal respondent is an expert willing to talk. Unless there is an obvious choice, such as the professor carrying out the research you are studying, use directories, such as local industrial guides, to locate potential respondents.

r **Is the person willing to be interviewed?** Contact the potential respondent by phone or in writing and state what you want to ask about. If the person is not able to help you, he or she might be willing to refer you to someone who can. Explain why you have decided to ask him or her. (A compliment works better than admitting that the person you really wanted to interview is out of town.) Explain what you plan to do with the information, such as write a report or present a talk. Then, if the person is willing to be interviewed, set up an appointment at his or her convenience.

**Conducting an Interview**

What are the characteristics of Trane products that led you to include them in your product line?

The unclear question can be answered in a number of unhelpful ways: “Be- cause they’re too expensive to give away” or “Because I’m a Trane dealer.”

**CLEAR**

**PREPARING FOR THE INTERVIEW**

Follow these suggestions for preparing for and conducting an interview—and for following up after the interview.

**Do your homework.** If you ask questions that have already been answered in the professional literature, the respondent might become annoyed and uncooperative.

**Prepare good questions.** Good questions are clear, focused, and open.

— **Be clear.** The respondent should be able to understand what you are asking.

**UNCLEAR** Why do you sell Trane products?

(*continued*)

— **Be focused.** The question must be narrow enough to be answered briefly. If you want more information, you can ask a follow-up question.

**UNFOCUSED** What is the future of the computer industry?

**FOCUSED** What will the American chip industry look like in 10 years?

— **Ask open questions.** Your purpose is to get the respondent to talk. Don’t ask a lot of questions that have yes or no answers.

**CLOSED** Do you think the federal government should create industrial partnerships?

**OPEN** What are the advantages and disadvantages of the federal gov- ernment’s creating industrial partnerships?

**Check your equipment.** If you will be recording the interview, test your voice recorder or video camera to make sure it is operating properly.

**BEGINNING THE INTERVIEW**

**Arrive on time.**

**Thank the respondent for taking the time to talk with you.**

**State the subject and purpose of the interview and what you plan to do with the information.**

**If you wish to record the interview, ask permission.**

**CONDUCTING THE INTERVIEW**

**Take notes.** Write down important concepts, facts, and numbers, but don’t take such copious notes that you can’t make eye contact with the respondent or that you are still writing when the respondent finishes an answer.

**Start with prepared questions.** Because you are likely to be nervous at the start, you might forget important questions. Have your first few questions ready.

**Be prepared to ask follow-up questions.** Listen carefully to the respondent’s answer and be ready to ask a follow-up question or request a clarification. Have your other prepared questions ready, but be willing to deviate from them if the respondent leads you in unexpected directions.

**Be prepared to get the interview back on track.** Gently return to the point if the respondent begins straying unproductively, but don’t interrupt rudely or show annoyance. Do not say, “Whoa! I asked about layoffs in this company, not in the whole industry.” Rather, say, “On the question of layoffs at this company, do you anticipate . . . ?”

**CONCLUDING THE INTERVIEW**

**Thank the respondent.**

**Ask for a follow-up interview.** If a second meeting would be useful, ask to ar- range one.

**Ask for permission to quote the respondent.** If you think you might want to quote the respondent by name, ask for permission now.

(*continued*)

**AFTER THE INTERVIEW**

**Write down the important information while the interview is fresh in your mind.** (This step is unnecessary, of course, if you have recorded the interview.) If you will be printing a transcript of the interview, make the transcript now.

**Send a brief thank-you note.** Within a day or two, send a note showing that you appreciate the respondent’s courtesy and that you value what you have learned. In the note, confirm any previous offers you have made, such as to send the respondent a copy of your final document.

*For more about inquiry letters, see Ch. 14, p. 367.*

*To find software for conducting surveys, search for “survey software.”*

When you wish to present the data from an interview in a document you are preparing, include a transcript of the interview (or an excerpt from the interview). You will probably present the transcript as an appendix so that readers can refer to it but are not slowed down when reading the body of the document. You might decide to present brief excerpts from the transcript in the body of the document as evidence for points you make.

Figure 6.7 is from a transcript of an interview with an attorney specializing in information technology. The interviewer is a student who is writing about legal aspects of software ownership.

### **INQUIRIES**

A useful alternative to a personal interview is to send an inquiry. This inquiry can take the form of a letter, an email, or a message sent through an organi- zation’s website. Although digital inquiries are more convenient for both the sender and the recipient, a physical letter is more formal and therefore might be more appropriate if the topic is important (concerning personnel layoffs, for instance) or related to safety.

If you are lucky, your respondent will provide detailed and helpful answers. However, the respondent might not clearly understand what you want to know or might choose not to help you. Although the strategy of the inquiry is essentially that of a personal interview, inquiries can be less suc- cessful because the recipient has not already agreed to provide information and might not respond. Also, an inquiry, unlike an interview, gives you little opportunity to follow up by asking for clarification.

### **QUESTIONNAIRES**

Questionnaires enable you to solicit information from a large group of peo- ple. You can send questionnaires through the mail, email them, present them as forms on a website, or use survey software (such as SurveyMonkey).

Unfortunately, questionnaires rarely yield completely satisfactory results, for three reasons:

r **Some of the questions will misfire.** Respondents will misinterpret some of your questions or supply useless answers.

|  |  |  |
| --- | --- | --- |
| *Interview Transcript, Page 1*  Q. Why is copyright ownership important in marketing software?  A. If you own the copyright, you can license and market the product and keep other people from doing so. It could be a matter of millions of dollars if the software is popular.  Q. Shouldn’t the programmer automatically own the copyright? | | **FIGURE 6.7 Excerpt**  **from an Interview** |
| A. If the programmer wrote the program on personal time, he or she should and does own the copyright.  Q. So “personal time” is the critical concept?  A. That’s right. We’re talking about the “work-made-for-hire” doctrine of copyright law. If I am working for you, anything I make under the terms of my employment is owned by you.  Q. What is the complication, then? If I make the software on my machine at home, I own it; if I’m working for someone, my employer owns it.  A. Well, the devil is in the details. Often the terms of employment are casual, or there is no written job description or contract for the particular piece of software.  Q. Can you give me an example of that?  A. Sure. There was a 1992 case, *Aymes v. Bonelli*. Bonelli owned a swimming pool and hired Aymes to write software to handle record keeping on the pool. This was not part  of Bonelli’s regular business; he just wanted a piece of software written. The terms of the employment were casual. Bonelli paid no health benefits, Aymes worked irregular hours, usually unsupervised—Bonelli wasn’t a programmer. When the case was heard, the court ruled that even though Bonelli was paying Aymes, Aymes owned the copyright because of the lack of involvement and participation by Bonelli. The court found that the degree of skill required by Aymes to do the job was so great that, in effect, he was creating the software by himself, even though he was receiving compensation for it.  Q. How can such disagreements be prevented? By working out the details ahead of time?  A. Exactly. The employer should have the employee sign a statement that the project is being carried out as work made for hire and should register the copyright with the U.S. Copyright Office in Washington. Conversely, employees should try to have the employer sign a statement that the project is not work made for hire and should try to register the copyright themselves.  Q. And if agreement can’t be reached ahead of time?  A. Then stop right there. Don’t do any work. |  | The student prompts the attorney to expand her answers. |
|  | The student responds to the attor- ney’s answers, making the interview more of a discussion. |

r **You won’t obtain as many responses as you want.** The response rate will almost never exceed 50 percent. In most cases, it will be closer to 10 to 20 percent.

r **You cannot be sure the respondents are representative.** People who feel strongly about an issue are much more likely to respond to questionnaires than are those who do not. For this reason, you need to be careful

in drawing conclusions based on a small number of responses to a questionnaire.

When you send a questionnaire, you are asking the recipient to do you a favor. Your goal should be to construct questions that will elicit the informa- tion you need as simply and efficiently as possible.

**Asking Effective Questions** To ask effective questions, follow two sug- gestions:

r **Use unbiased language.** Don’t ask, “Should U.S. clothing manufacturers protect themselves from unfair foreign competition?” Instead, ask, “Are you in favor of imposing tariffs on men’s clothing?”

r **Be specific.** If you ask, “Do you favor improving the safety of automobiles?” only an eccentric would answer no. Instead, ask, “Do you favor requiring automobile manufacturers to equip new cars with electronic stability control, which would raise the price by an average of $300 per car?”

Table 6.2 explains common types of questions used in questionnaires.

Include an introductory explanation with the questionnaire. This expla- nation should clearly indicate who you are, why you are writing, what you plan to do with the information from the questionnaire, and when you will need it.

#### TABLE 6.2 Common Types of Questions Used in Questionnaires

**TYPE OF QUESTION EXAMPLE COMMENTS**

Multiple choice Would you consider joining a company-

sponsored sports team? Yes No

Likert scale The flextime program has been a success in its

first year.

strongly disagree strongly agree

Semantic differentials Logging on to the system

simple difficult

The description of the new desalinization process

interesting boring

Ranking Please rank the following work schedules in order of preference. Put a 1 next to the schedule you would most like to have, a 2 next to your second choice, and so on.

8:00–4:30

9:00–5:30

8:30–5:00

flexible

The respondent selects one of the alternatives.

The respondent ranks the degree to which he or she agrees or disagrees with the statement. Using an even number of possible responses (six, in this case) increases your chances of obtaining useful data.

With an odd number, many respondents will choose the middle response.

The respondent registers a response along a continuum between a pair of opposing adjectives. Usually, these questions measure a person’s feelings about a task, an experience, or an object. As with Likert scales, an even number of possible responses yields better data.

The respondent indicates the priority of a number of alternatives.

(*continued*)

#### TABLE 6.2 Common Types of Questions Used in Questionnaires (*continued*)

**TYPE OF QUESTION EXAMPLE COMMENTS**

Short answer What do you feel are the major advantages of

the new parts-requisitioning policy?

1.

2.

3.

Short essay The new parts-requisitioning policy has been

in effect for a year. How well do you think it is working?

The respondent writes a brief answer using phrases or sentences.

Although essay questions can yield information you never would have found using closed-ended questions, you will receive fewer responses to them because answering them requires more effort. Also, essays cannot be quantified precisely, as data from other types of questions can.

**Testing the Questionnaire** Before you send out *any* questionnaire, show it and its accompanying explanation to a few people who can help you iden- tify any problems. After you have revised the materials, test them on people whose backgrounds are similar to those of your intended respondents. Revise the materials a second time, and, if possible, test them again. Once you have sent the questionnaire, you cannot revise it and resend it to the same people.

**Administering the Questionnaire** Determining who should receive the questionnaire can be simple or difficult. If you want to know what the resi- dents of a particular street think about a proposed construction project, your job is easy. But if you want to know what mechanical-engineering students in colleges across the country think about their curricula, you will need a background in sampling techniques to identify a representative sample.

Make it easy for respondents to present their information. For mailed questionnaires, include a self-addressed, stamped envelope.

Figure 6.8 on page 142 shows a sample questionnaire.

**Presenting Questionnaire Data in Your Document** To decide where and how to present the data that you acquire from your questionnaire, think about your audience and purpose. Start with this principle: important information is presented and analyzed in the body of a document, whereas

less-important information is presented in an appendix (a section at the end that only some of your audience will read). Most often, different versions of the same information appear in both places.

*For more about testing documents, see Ch. 13, p. 348.*

**FIGURE 6.8**

**Questionnaire**

September 6, 2015

To: All employees

From: William Bonoff, Vice President of Operations Subject: Evaluation of the Lunches Unlimited food service

As you may know, every two years we evaluate the quality and cost of the food service that caters our lunchroom. We would like you to help in our evaluation by sharing your opinions about the food service. Please note that your responses will remain anonymous. Please drop the completed questionnaires in the marked boxes near the main entrance to the lunchroom.

1. Approximately how many days per week do you eat lunch in the lunchroom?

0 1

2 3

4 5

1. At approximately what time do you eat in the lunchroom?

11:30–12:30

12:00–1:00

12:30–1:30

varies

Likert-scale questions 3 and 4 make it easy for the writer to quantify data about subjective impressions.

1. A clean table is usually available.

strongly disagree strongly agree

1. The Lunches Unlimited personnel are polite and helpful.

strongly disagree strongly agree

1. Please comment on the quality of the different kinds of food you have eaten in the lunchroom.
   1. Daily specials

excellent

good

satisfactory

poor

* 1. Hot dogs and hamburgers

excellent

* 1. Other entrées excellent

good

good

satisfactory

satisfactory

poor

poor

Short-answer questions 6 and 7

1. What *foods* would you like to see served that are not served now?

are best for soliciting ideas from respondents.

1. What *beverages* would you like to see served that are not served now?
2. Please comment on the prices of the foods and beverages served.
   1. Hot meals (daily specials)

too high

fair

a bargain

* 1. Hot dogs and hamburgers

too high

* 1. Other entrées too high

fair

fair

a bargain

a bargain

1. Would you be willing to spend more money for a better-quality lunch if you thought the price was reasonable?

yes, often

sometimes

not likely

1. On the other side of this sheet, please provide whatever comments you think will help us evaluate the catering service.

Thank you for your assistance.

Typically, the full questionnaire data are presented in an appendix. If you can, present the respondents’ data—the answers they provided—in the ques- tionnaire itself, as shown here:

1. Approximately how many days per week do you eat lunch in the lunchroom? 0 **12** 1 **16** 2 **18** 3 **12** 4 **9** 5 **4**
2. At approximately what time do you eat in the lunchroom? 11:30–12:30 **3** 12:00–1:00 **26** 12:30–1:30 **7** varies **23**

Selected data might then be interpreted in the body of the document. For instance, you might devote a few sentences or paragraphs to the data for one of the questions. The following example shows how a writer might discuss the data from question 2.

Question 2 shows that 26 people say that they use the cafeteria between noon and 1:00. Only 10 people selected the two other times: 11:30–12:30 or 12:30–1:30. Of the 23 people who said they use the cafeteria at various times, we can conclude that at least a third—8 people—use it between noon and 1:00. If this assumption is correct, at least 34 people (26 + 8) use the cafeteria between noon and 1:00. This would explain why people routinely cannot find a table in the noon hour, especially between 12:15 and 12:30. To alleviate this problem, we might consider asking department heads not to schedule meetings between 11:30 and 1:30, to make it easier for their people to choose one of the less-popular times.

The body of a document is also a good place to discuss important nonquan- titative data. For example, you might wish to discuss and interpret several representative textual answers to open-ended questions.

#### ETHICS NOTE

**REPORTING AND ANALYZING DATA HONESTLY**

When you put a lot of time and effort into a research project, it’s frustrating if you can’t find the information you need or if the information you find doesn’t help you say what you want to say. As discussed in Chapter 2, your responsibility as a professional is to tell the truth.

If the evidence suggests that the course of action you propose won’t work, don’t omit that evi- dence or change it. Rather, try to figure out why the evidence does not support your proposal. Present your explanation honestly.

If you can’t find reputable evidence to support your claim that one device works better than another, don’t just keep silent and hope your readers won’t notice. Explain why you think the evidence is missing and how you propose to follow up by continuing your research.

If you make an honest mistake, you are a person. If you cover up a mistake, you’re a dishonest person. If you get caught fudging the data, you could be an unemployed dishonest person. If you don’t get caught, you’re still a smaller person.

If you think your reader will benefit from analyses of the data, present such analyses. For instance, you could calculate the percentage for each response: for question 1,“12 people—17 percent—say they do not eat in the cafeteria at all.” Or you could present the percentage in parentheses after each number: “12 (17%).”

**RESEARCHING YOUR SUBJECT**

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**WRITER’S CHECKLIST**

 Did you determine the questions you need to answer for your document? *(p. 117)*

Did you choose appropriate secondary-research tools to answer those questions, including, if appropriate,

 online catalogs? *(p. 121)*

 reference works? *(p. 121)*

 periodical indexes? *(p. 122) * newspaper indexes? *(p. 122) * abstract services? *(p. 123)*

 government information? *(p. 123)*

 social media and other interactive resources? *(p. 124)*

In evaluating information, did you carefully assess  the author’s credentials? *(p. 129)*

 the publisher? *(p. 129)*

 the author’s knowledge of literature in the field? *(p. 130)*

 the accuracy and verifiability of the information? *(p. 130)*

 the timeliness of the information? *(p. 130)*

Did you choose appropriate primary-research methods to answer your questions, including, if appropriate,

 social-media data analysis? *(p. 130)*

 observations and demonstrations? *(p. 133)*

 inspections? *(p. 134)*

 experiments? *(p. 134) * field research? *(p. 135) * interviews? *(p. 136)*

 inquiries? *(p. 138)*

 questionnaires? *(p. 138)*

 Did you report and analyze the data honestly? *(p. 143)*

#### EXERCISES

*For more about memos, see Ch. 14, p. 372.*

1. Imagine you are an executive working for a company that distributes books to bookstores in the Seattle, Washington, area. Your company, with a 20,000-square- foot warehouse and a fleet of 15 small delivery vans, employs 75 people. The following are three questions that an academic researcher specializing in energy issues might focus on in her research. Translate each of these academic questions into a workplace question that your company might need to answer.
   1. What are the principal problems that need to be resolved before biomass (such as switchgrass) can become a viable energy source for cars and trucks?
   2. How much money will need to be invested in the transmission grid before windmills can become a major part of the energy solution for business and residential customers in the western United States?
   3. Would a federal program that enables companies to buy and sell carbon offsets help or hurt industry in the United States?
2. For each of the following questions, select a research technique that is likely to yield a useful answer. For

instance, if the question is “Which companies within a 20-mile radius of our company headquarters sell

recycled paper?” a search of the web is likely to provide a useful answer.

1. Does the Honda CR-V include traction control as a standard feature?
2. How much money has our company’s philanthropic foundation donated to colleges and universities in each of the last three years?
3. How does a 3D printer work?
4. Could our Building 3 support a rooftop green space?
5. How can we determine whether we would save more money by switching to LED lighting in our corporate offices?
6. Using a search engine, answer the following questions. Provide the URL of each site that provides information for your answer. If your instructor requests it, submit your answers in an email to him or her.
   1. What are the three largest or most important professional organizations in your field? (For example, if you are a construction management

**Case 6: Revising a Questionnaire**

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major, your field is construction management, civil engineering, or industrial engineering.)

* 1. What are three important journals read by people in your field?
  2. What are three important online discussion lists or bulletin boards read by people in your field?
  3. What are the date and location of an upcoming national or international professional meeting for people in your field?
  4. Name and describe, in one paragraph for each, three major issues being discussed by practitioners or academics in your field. For instance, nurses might be discussing the effect of managed care on the quality of medical care delivered to patients.

1. Revise the following interview questions to make them more effective. In a brief paragraph for each, explain why you have revised the question as you have.
   1. What is the role of communication in your daily job?
   2. Do you think it is better to relocate your warehouse or go to just-in-time manufacturing?
   3. Isn’t it true that it’s almost impossible to train an engineer to write well?
   4. Where are your company’s headquarters?
   5. Is there anything else you think I should know?
2. Revise the following questions from questionnaires to make them more effective. In a brief paragraph for each, explain why you have revised the question as you have.
   1. Does your company provide tuition reimbursement for its employees? Yes No
   2. What do you see as the future of bioengineering?
   3. How satisfied are you with the computer support you receive?
   4. How many employees work at your company? 5–10 10–15 15 or more
   5. What kinds of documents do you write most often? memos letters reports
3. **TEAM EXERCISE** Form small groups, and describe and evaluate your college or university’s website. A different member of the group might carry out each of the following tasks:

**t** In an email to the site’s webmaster, ask questions about the process of creating the site. For example, how involved was the webmaster with the content and design of the site? What is the webmaster’s role in maintaining the site?

**t** Analyze the kinds of information the site contains, and determine whether the site is intended primarily for faculty, students, alumni, legislators, or prospective students.

**t** Determine the overlap between information on the site and information in printed documents published by the school. In those cases in which there is overlap, is the information on the site merely a duplication of the printed information, or has it been revised to take advantage of the unique capabilities of the web?

In a memo to your instructor, present your findings and recommend ways to improve the site.

###### For more practice with the concepts covered in this chapter, complete the LearningCurve activity “Researching Your Subject”

**under “Additional Resources” in Ch. 6:** [**macmillanhighered.com**](http://macmillanhighered.com/launchpad/techcomm11e)

[**/launchpad/techcomm11e**](http://macmillanhighered.com/launchpad/techcomm11e)**.**

  **CASE 6: Revising a Questionnaire**

You’re a marketing director at a real-estate company who is trying to determine whether it would be cost-effective to have the company’s agents take property photos instead of having the photos taken by the professional photographers from the supplier with which you currently contract. You ask one of your agents to develop a questionnaire to gauge agents’ reactions to and opinions about the possibility of adding photography to their responsibilities, but you find that her questionnaire needs considerable revising before it will be an effective tool. To access the questionnaire and begin assessing it, go to“Cases” under“Additional Resources” in Ch. 6: [**macmillanhighered.com/launchpad/techcomm11e**](http://macmillanhighered.com/launchpad/techcomm11e).

