

An Introduction to Technical Communication

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Communicating About Technology

We live in a world in which many of our everyday actions depend on complex but important technical information. When you purchase a wallet-sized calculator, for example, the instruction manual is often larger than the calculator itself. When you install any new device, from a VCR to a microwave oven to a cable modem or new computer, it's the setup information that you look for as soon as you open the box. Household appliances, banking systems, online courses, business negotiations, government correspondence and affairs, and almost every other aspect of your daily life is affected by technologies and technical information.

Technical communication has existed since the very earliest times of human writing. The Sumerians, in 3200 BCE, used a stylus and a block of wet clay to record information (Wilford, 1999). Most people trace the rise of modern technical communication as a profession to the United States after World War II. The rapid development of new technologies during this time created a need for accompanying technical information, such as instructions, manuals, and documentation. And in the 1970s, when the personal computer was invented, well-designed technical communication became vital as more and more nontechnical people began using computers, software, and other devices. Today, with a large percentage of the population using the Internet, banking via the telephone, and interacting with technology in so many other ways, we all recognize the importance of well-designed technical information.

Main Characteristics of Technical Communication



1.1

Technical communication is the art and science of making complex technical information *accessible*, *usable*, and *relevant* to a variety of people in a variety of settings. To some extent, effective technical communication is an art, because it requires an instinct for clear writing and good visual design. More importantly though, technical communication is also a science, a systematic process that involves certain key principles and guidelines. The following principles characterize effective technical communication.

Accessibility

Information is accessible if people actually can get to it and understand it. If documentation for a help system is included on CD-ROM, the people using this information must access a CD-ROM drive in order to use the information. If a set of instructions is being distributed across the globe, these instructions must be written in various languages in order to be accessible to international users.

A group of technical editors at IBM has developed a list of “quality characteristics,” which help them determine if their technical documentation meets high standards and is of superior quality. These characteristics suggest specific ways in which communication can be made accessible:

- Accuracy—has no mistakes or errors
- Clarity—avoids ambiguity
- Completeness—includes all necessary information
- Concreteness—uses concrete examples and language
- Organization—follows sequences that make sense for the situation
- Visual effectiveness—uses layout, screen design, color, and other graphical elements effectively (Hargis, Hernandez, Hughes, & Ramaker, 1997, p. 2)

Usability

Usable information is *efficient*, because it allows your audience to perform the task or retrieve the information they need as quickly and easily as possible. Usability is often measured by studying the design of the table of contents, index, headings, and page layout, as well as determining if the language is written at the appropriate technical level. When technical communicators assess a document's usability, they may want to know how long it took a person using the document to find specific information and whether this information could be located using the index or table of contents. For instance, a manager may consult the company's Employee Handbook for information about vacation time. If the manager cannot find this information and cannot do so quickly, the document would not be considered usable and would need to be revised. (Learn more about usability in Chapter 3.)

Relevance

Relevant information maintains a focus on the specific *audience*—the readers, listeners, viewers—who need information, not piles of useless data. Information is relevant if the audience can apply it to the task at hand. For instance, if a person is interested in how to use Internet service provider (ISP) software to connect to the Internet, the documentation should explain how to install the software and dial up the ISP and not digress into a history of how the Internet developed. Similarly, for an audience of general computer users who want to install a sound card, overly technical language is inappropriate. Relevant information also maintains a focus on the *purpose* of the communication. Although the history of sound cards might be interesting to some engineers, the purpose of the communication (how to install the sound card) dictates that this history is not relevant.

Often, technical communication is thought of in relation to the documents and technologies described above; that is, technical communication is

designed to teach a general audience how to perform a specific task involving a common sort of technology—how to set up a VCR, install a new sound card in a PC, or install the mulching blade on a lawn mower. But technical information is also used by technical specialists, managers, and others. A surgeon performing heart surgery must have clear information about how to install a pacemaker. A government research scientist must have accurate instructions about how to write a grant or how to perform a particular experiment. An engineer must have access to the right specifications for designing a bridge or configuring an application. In all settings in which people must understand complex information, there is a need for technical communication.

Consider the following example, which illustrates just one of these ideas: how technical information is made *accessible* by the writer's use of consistent terminology. Unlike some forms of writing, in which authors are often told to vary their choice of words, technical communication strives for accuracy by using consistent terminology when referring to the same item or task.

For example, assume that you have just purchased a new children's toy that needs assembling. In one case, the writer of the instructions decided that she would vary the terminology. Here is her first draft:

Your new RetroRocket comes with the following parts:

- **main fuselage**
- **wing assembly**
- five (5) coupling bolts
- three (3) cotter pins
- wheel assembly

To assemble the rocket, take the **main body** and the **wings**. Place these in position

to each other as shown on the cartoon. Take several of the round bolts . . .

These terms are not consistent

The list of parts says “main fuselage” and “wing assembly” but the instructions say “main body” and “wings.” Are these the same pieces? If you don’t use the same terms, how will your reader know?

No list of technical communication characteristics can address all possible situations and decisions you will encounter. Whenever you work, you will face challenges that ultimately require your best analytical and social skills. For instance, “clarity” is a typical characteristic of technical communication. But in some cases, being crystal clear may be impossible, because you can’t get

enough information. In other situations, clarity and directness may be seen as overly blunt and offensive to some readers. As you read this book, remember that communication ultimately takes place in companies, among people, in situations that change, and often under time and budget pressures.

Types of Technical Communication

Some common forms of technical communication are listed below. Although these categories can overlap considerably, they should give you a feel for the kinds of documents technical communicators produce.

- **Manuals.** Almost every technology product or service is accompanied by a manual. Manuals may include information on how to use a product, along with background information, such as technical specifications or lists of materials. You certainly have used such manuals—to connect the components of your sound system, to do routine maintenance on your bicycle or inline skates, or to set up your answering machine.
- **Procedures.** Procedures are an important form of technical communication. Procedures explain how to perform a task or how a particular process happens. Many companies maintain standard operating procedures (“SOPs”) for tasks such as how to test soil samples or how to access corporate databases.
- **Instructions.** Instructions resemble manuals and procedures in that they explain how to do something. However, instructions are often very specific, systematic lists of the actual steps involved in using a product or performing a procedure. For instance, if you purchase a memory upgrade for your computer, you will probably receive a list of instructions on how to install this upgrade. This list may be a separate document or part of a manual or larger set of instructions.
- **Quick reference cards.** In some situations, a long list of procedures or instructions is inappropriate, because the user is already familiar with the “big picture.” For instance, you may regularly call home to access your voice mail, and you may have the primary commands memorized. But there are certain tasks you may perform infrequently, such as changing your outgoing message from another phone. For tasks that users perform on a limited basis, a short summary of the keypad commands may be all that is needed. These commands can often fit on a quick reference card designed to fit in a wallet or fit in with the actual device (over the telephone keypad, for instance).
- **Reports.** There are many types of reports, including recommendation reports and analytical reports. Reports generally focus on a specific problem, issue, or topic. They may recommend a course of action or analyze a particular technology or situation. For example, a task force in your

community may be studying plans for highway expansion or a new shopping center. After completing an initial study, task forces often present reports to the city council or other decision makers, and written copies of these reports are available for public review.

- **Proposals.** Proposals make specific recommendations and propose solutions to technical problems. A proposal's purpose is usually to persuade readers to improve conditions, accept a service or product, or otherwise support a plan of action. Proposals are sometimes written in response to calls for proposals (CFPs) or requests for proposals (RFPs). For example, a nonprofit childcare facility may seek safer playground equipment, or a pharmaceutical company may wish to develop a new Web-based education program for its employees. These organizations would issue RFPs, and each interested vendor would prepare a proposal that examines the problem, presents a solution, and defines the process and fees associated with implementing the solution.

- **Memos.** A vital form of technical communication, memos serve various purposes: to inform, to persuade, to document, or to encourage discussion. Memos are usually brief and follow a format that includes a header (“to,” “from,” “date,” “re”) and 1–2 pages of body text. An employee might write a memo to his manager requesting a pay raise; an engineer might write a memo to her design team explaining a technical problem and offering a solution; a team of students might write a memo to their instructor explaining their progress on a class project.

- **Email.** Email is, essentially, the electronic version of a memo. In fact, most email is patterned after the memo, with a header containing fields for “to,” “from,” “date,” and “re” already built in. Yet email messages are more pervasive than paper memos. In most work settings, people use email to relay scheduling, policy, procedure, and miscellaneous information. They communicate via email with clients, customers, and suppliers—as well as with associates worldwide. People are more inclined to forward email messages, and tend to be more casual and write more hastily than they would with paper memos.

Although these forms are common, many others exist, depending on the company or profession. Nursing, for example, requires specific forms for documenting a patient's medical condition; engineering has its own types of technical communication. In addition, the specific audience and purpose in each situation will determine the appropriate type of communication.

Various types of communication can also be formatted and packaged in various media:

- CD-ROM
- Internet Web pages (the entire worldwide Internet)
- Intranet Web pages (an internal network)
- Electronic text, including email or attachments
- Online help

- Printed matter, including books, paper memos, bound reports, and brochures
- Training sessions or oral presentations



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Technical Communication in the Workplace

People who make technical information accessible to different audiences are called “technical communicators.” In more and more organizations, this position is a full-time job, with titles including the following:

- Technical writer
- Technical editor
- Web designer
- Online documentation specialist
- Information developer
- Instructional developer

Technical communicators write and design documentation, online information, software interfaces, and other documents and materials for users of high technology. Technical communicators also write technical memos, reports, grant applications, and other specialized documents.

Virtually all technical professionals, at one time or another, function as part-time technical communicators. These technical experts are often required to present their knowledge to nonexpert audiences. For instance, a nuclear engineer testifying before Congress would need to explain nuclear science to nonscientists and to address the concerns of policymakers. People from many other walks of life (lawyers, health care professionals, historians, managers, and so on) communicate specialized information to nonexpert audiences:

- Medical professionals discuss health matters with patients.
- Attorneys interpret the law for client.
- Historians describe complex historical events for people who did not experience those events.
- Managers interpret business objectives for those they supervise.

Technical Communication in an Electronic Age

Electronic technologies allow far more communication today than ever before. Long before people had a telephone, voice mail, email, Web access, a pager, or a cell phone, they communicated by speaking and writing. We still do this: we

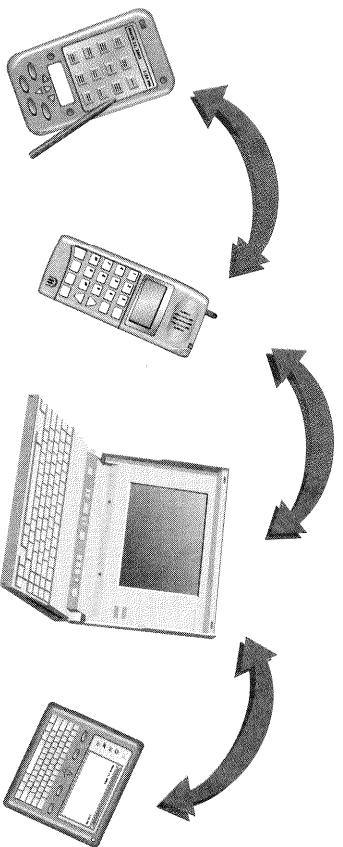


Figure 1.1 Electronic communication devices. We live in an age of information overload. Effective technical communication can help people manage and sort through this information.

have meetings or go down the hall to speak with a colleague, and we still send letters, print newspapers, and read books. Today, though, we send and receive information through an even greater number of channels. Although we may enjoy the efficiency of email, the convenience of voice mail, and the cost savings of teleconferences, it is also apparent that many professionals are suddenly struggling with information overload (Figure 1.1). And the more information people receive on a daily basis, the more urgent the need to make sure this information is accessible, usable, and relevant. In short, our information-saturated society cries out for effective technical communication.

Societal Dimensions of Technical Communication

Good technical communication has a societal component, because it can make important topics in science and technology (e.g., genetically modified organisms, cloning, computers that diagnose disease) understandable to the general public. Such communication opens doors to new information—doors that might otherwise remain shut if the information were hard to read, too technical, or impossible to interpret. If the general public tried to learn about these topics by reading technical journals, they would come away scratching their heads, because the language and presentation would be too technical for general readers. But if this information is written to match the reader's level of knowledge, readers can understand these important topics. In a world in which science and technology play major roles in our everyday lives, technical communication becomes increasingly important. When you create effective technical communication, you not only help others use the information, but you also help people learn about important ideas.

Ethical Dimensions of Technical Communication

Technical communication involves an ethical stance as well, because the words, fonts, graphics, and colors that convey the information may influence your audience's perception, interpretation, and understanding. For example, think of the many advertising claims hinting that certain herbal remedies may cure diseases. These claims, technical in nature, often have no basis in traditional scientific methods. Yet some technical communicators chose (or was instructed) to write these words. The workplace pressures of communicating what the boss wants, or what will make more money for the company, are often at odds with the ethical pressures to present information fairly and accurately. Visual communication, such as charts and graphs, can also be misused. Later chapters address the ethical issues involved in technical communication. In the end, you will need to balance your own ethical stance against the interests of others, including your company and your customers or end users.



Review Checklist

| <i>Characteristics of Quality Technical Communication</i> | <i>Questions You Should Ask</i> |
|--|---|
| Accessible —users can find what they need | Is the information <i>accurate</i> ? Is the language <i>clear</i> and unambiguous? Is the information <i>complete</i> ? |
| Usable —users can use the information to perform a task | Are the examples <i>concrete</i> ? Is the material appropriately <i>organized</i> ? Is <i>visual information</i> (layout, screen design, color) used effectively? |
| Relevant —users can relate the content to their task or project | Can users find what they need in an <i>efficient</i> manner? Is language at an appropriate <i>technical level</i> ? Does the document contain a <i>table of contents</i> , index, or other such device? Is the material appropriate for this to <i>audience</i> ? Is the material appropriate for and relevant to the <i>purpose</i> at hand? |



Exercises

1. Locate an example of a technical document and bring it to class. Use the review checklist above to explain to other students why your selection can be called “technical communication.” Explain how your selection is accessible, usable, and relevant.
2. **Focus on Writing.** Research the kinds of writing you will do in your career. (Begin with the *Dictionary of Occupational Titles* in your library or on the Web.) Interview a member of your chosen profession or a technical communicator in a related field or industry. What types of writing can you expect to do on the job? For what audience(s) will you be writing? How much of your writing will be transmitted or published in electronic forms (Web sites, intranets, etc.)? Summarize your findings in a memo to your instructor or in a brief oral report to your class.
3. **Focus on Writing.** Assume that a friend in your major thinks that technical communication skills are not needed—that anyone can write or design information without thought to issues of access, usability, or relevance. Write your friend a memo based on the information in this chapter explaining why you think these assumptions are mistaken. Use examples (brochures, Web pages, other technical communication) to support your position. (See pages 189–192 for details on memo formats.)



The Collaboration Window

Most writing and communicating, especially in the workplace, is done collaboratively: that is, it is done by and among many people and takes numerous ideas and suggestions into account. In class, form teams of students who have the same or similar majors or interests.

Your assignment. Create a list of technical terms and concepts, with short explanations, that you feel are important for people to understand your major or career interest; in other words, create a miniature “dictionary” for your major or field. Your list may consist of only 10 terms and must fit on a single page. Collaborate on forming this list as follows:

- Each person in the group should create an individual list.
- When everyone is done, compile these lists into one master list. You will need to negotiate among members of your group about what 10 terms to keep and how to define these terms. Share your list with the other groups in class.



The Global Window

Technical communication is an international activity. Technical products and services are used around the world, and communicators need to create information that is attentive to international needs. For example, if a company is shipping microcassette tape recorders to several countries, the documentation must be written in clear English that can easily be translated and contains internationally recognized symbols or visual information.

Your assignment. Locate technical documentation that is written in English plus several other languages (instructions for household appliances, tools, or stereo equipment is often written in several languages). How many languages were used? Why did this company select these languages? Compare your findings with those of other students.

To learn more about global communication, use a Web search engine to locate information about the International Standards Organization (ISO). This group specializes in creating technical and communication standards for worldwide use. Identify a particular aspect of this site that you find interesting or that is related to your major, and share this information in class.



Click on This

Locate an example of technical communication on the Web. Try a few of the Web pages listed below to get you started, or use a search engine to locate Web pages related to your career or technical interest. Bring printouts of one or several pages to class, and work with a group of students to identify examples—both good and bad—of the characteristics (accessible, usable, relevant, and so on) discussed in this chapter.

- www.nlm.nih.gov/locatorplus
The National Library of Medicine’s Web catalog of over 5.3 million books and other materials.
- <http://ehb.cs.berkeley.edu/photos/>
The CalPhotos project at the University of California, Berkeley, houses over 45,000 images of plants, animals, fossils, people, and landscapes.
- www.lanl.gov/worldview
The home page for the Los Alamos National Laboratory, with photos and descriptions of the lab’s research projects.