TECHNICAL WRITING:
Method, Application, and Management

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John W. Presley, Ph.D.

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NOTICE TO THE READER

Preface

Technical Writing: Method, Application, and Management speaks to two audiences — students beginning to explore technical communication as a major field of study and students learning technical communication as a personal or degree requirement for a particular technical or scientific major. Typically, we teach classes composed of both groups, and they have guided us in selecting the content and special features of this book.

The content of *Technical Writing* is divided into three sections.

Part One (Chapters 1–7) addresses the writing process as the basis of technical writing. Each chapter discusses a particular phase of the writing process for use in technical writing. Thus, the organization chapter (Chapter 5) reviews not only the basics of outlining, but it concentrates specifically on the outlines that technical writers use such as decimal and headline outlines. Each chapter of this section features a process diagram to show the objective or topic as part of the writing process.

Part Two (Chapters 8–16) treats the specific types of technical communications you may draft for college or for your occupation. Since professionals, managers, and technicians need to complete various kinds of technical communications on the job, we supply checksheets, outlines, and other guides in these chapters to show how to apply the general strategies of the writing process to specific assignments.

Part Three (Chapters 17 and 18) introduces you to the world of corporate technical writing by describing how a publications group works and by introducing cost estimating.

Overall, *Technical Writing: Method, Application, and Management* prepares students for the corporate culture in which they will collaborate with associates to plan, budget, draft, and produce technically oriented publications.

In addition to comprehensive content coverage, *Technical Writing* contains several special features:

Case Studies. Each chapter starts with a case study of a technical communication problem that is work-related. The chapter then develops the writing problems outlined in the case study as we explain how to apply knowledge to communications in a given situation. The case studies are drawn from the experiences of students who work as they attend college and our graduates in industry; thus, as a collection, the cases answer many questions students may have about writing for occupational purposes.

Varieties of Writing. The cases and the examples in the chapters expose students to the vast collection of documents that can be called "technical communication" including computer manuals, office procedures manuals, proposals, science lab reports, various types of correspondence, and other technical documents. There are as many kinds of technical communications as there are occupations, and new needs and requirements will emerge during an individual's career. By studying examples from the various occupations, students can be prepared for a career of continuous growth and learning about the types of writing they will need to do well to excel in their professions.

Students' Writing. As you skim this book, you'll notice that we include passages written by students. We also show how the students revised and edited their work. We have selected case histories and passages from a variety of students: young undergraduates; working adult undergraduates, parents who attend college, graduate students, and occupational specialists who attend school to retrain or upgrade. All of these people share writing problems that are universally experienced, and including their work allows other students to see how these problems can be approached.

ACKNOWLEDGEMENTS

ABOUT THE AUTHORS

Alice I. Philbin has taught technical communication, composition, and literature to students in high school, college, graduate, and post-secondary, occupational programs. A former technical journal editor, Dr. Philbin developed and taught on-site technical communication and career development courses for all the branches of the United States military services. During her tenure at Bowling Green State University, Dr. Philbin has maintained her consulting practice with businesses, taught in the undergraduate and graduate scientific and technical communication programs, and serves currently as Director of Graduate Studies for the Department of English.

John W. Presley has taught, and written about, writing at every level, from basic to advanced, for several colleges and universities since 1970. He has taught business and technical writing in the private sector as well, and has written or edited a half-dozen textbooks on reading and writing. Dr. Presley is currently Professor of Business Administration at Augusta College, where he also works in the Academic Affairs Office. In addition to teaching graduate courses in communications, he supervises faculty development and curricular revision. Firmly convinced that writing varies only by audience and purpose, Dr. Presley is also a published poet.

Contents

Method

PART ONE

Definitions of Technical Communication

Good technical writing requires an understanding of the ways technical professionals communicate. In reading this chapter, you will learn how successful technical professionals:

- Define technical communication.
- Discuss basic terms they use.
- List characteristics of good technical communication.
- Describe major types of technical communication used in business, industry, and other workplaces.

Many workers and students need help with their technical writing in order to reach goals or to sustain job success. Because technical communicators work in many professions, the following random sample shows the diversity and complexity of their tasks.

Louise Mitchell — an operations manager who must compile a lengthy feasibility report for her manager, a corporate vice-president.

Bob Andrews and Ann Middleton — two individualistic employees who must together prepare for a client a series of recommendations for purchasing two corporate airplanes.

Steve and Elaine Miska — owners of a small construction company who must use the library's resources to diversify and expand their business.

Bill Dorsey — a technical writer for a consulting firm who must continually win new contracts to expand the firm's business. To maintain a client list, Bill writes successful proposals and feasibility studies.

Sue Chin — a college senior majoring in environmental science. She must learn to organize a report on methods of radon detection in the home.

Laura Heberlein — a successful business major in college. For a required technical writing course, she is learning to revise and edit her technical communication.

Pat Pryer — a gifted programmer who has developed a software package for scheduling team sports. She must design appropriate illustrations for the product's users.

John Sanchez — a technical communication student who must complete a set of assembly instructions during his internship. Although John writes well, he must illustrate his instructions so users can assemble their furniture from his drawings, not his text.

Randy Goetz and Linda Harris — job applicants. Randy, a recent college graduate, must find his first job. His sister Linda, an experienced technician, must reposition herself in the job market.

Joe Rachiele — a veteran and owner-operator of a small electronics business. His business requires extensive paperwork and communication with suppliers and customers, so he needs a work file of form letters and memoranda.

Carlos Andrade — a training evaluator who writes for his livelihood. As a consultant, he writes progress reports, closeout reports, and multivolume studies of his clients' training programs.

Ved Krishnan — an accountant who understands accounting software packages. He must write procedures for his relatives and business associates that explain how a computer disk operating system packages a file for easy, systematic access.

Ted Wilson — a successful agricultural journalist. He must conquer his fear of public speaking to promote the Society for Technical Communication among college students and local technical writers.

Maryann Hasama — a graduating technical communication major. Despite excellent writing skills, she is unprepared to work in a corporation. To succeed, Maryann must learn how corporate writers publish and distribute their work.

Jeff Beetham — a young technical writer recently promoted to his first management position because of his excellent writing in waste management proposals. Jeff must now learn to plan, schedule, and estimate the costs of his employees' work.

Each of these 18 technical communicators has a special communication need. This book analyzes the various communication problems these writers face. While examining these and other writers' drafts, you will meet still more technical communicators.

DEFINITION OF TECHNICAL WRITING

The first step is to define technical communication. Is it technical writing? Or is that term too exclusive? Is there, for example, technical speech as well? Where are examples of technical communication found? Is technical communication on television or is technical communication only a written medium?

We can answer these questions neither easily nor quickly. Lengthy works elaborate the philosophy and psychology of rhetoric, expository writing and its origins, occupational and business English, interpersonal communication, journalism, and mass communication. Technical communication combines ideas and practices from all of these fields and borrows techniques from such diverse disciplines as training and development and public relations. Although no one chapter of this book covers the antecedents of technical communication in all of these areas, we can outline some basic terms, some theoretical bases, and certain applications to your education and future employment.

Some Terms and Assumptions

Before reading on about the applications of technical communication, you need to know some of the discipline's basic terms:

Technical communication—a universal expression that refers to the written documents, videotapes, slide shows and other illustrated learning aids, demonstrations, and electronic messages created by professional writers and designers. Because this field changes rapidly, "communication" is more generic than writing, and "technical" more comprehensive than "scientific." For example, a user manual for a word processing software package and a flight simulation program for training pilots are technical communications.

Technical writing—printed or electronically transmitted messages. These include instructions, manuals, procedures, statements of policies, articles for publication, and various other technology-related communications designed for publication. The magazine *Fine Woodworking*, with its numerous feature stories and regular columns on woodworking technology, is an example of technical writing.

Scientific communication—again, a general term for all the kinds of communication about various fields of science. The television program *Nova* is an outstanding example of scientific communication.

Scientific writing—printed or electronically transmitted messages, including laboratory reports, experimental results for publication, and scientific discussions of specific theories and applications, designed for public reading. A classic example is *Scientific American*.

Scientific and technical communication are often taught as one discipline. In fact, this book contains a sample lab report and several examples of writing in the applied sciences. But the sciences and technologies have so expanded, that the essential differences between the two fields are more noticeable. Thus, this text, though containing examples of scientific writing, emphasizes technical writing.

Listed below are more terms that will help you understand this overview of technical communication.

Technical journalism — communication about science and technology for the general public, transmitted by the mass media such as newspapers, magazines, and television. *Car and Driver* is a technical magazine.

Oral technical communication — spoken communication about science or technology, delivered to an audience either live or via videotape. The popular television program, *This Old House*, is a well-engineered example of oral technical communication.

Documentation — the generic term for industry-generated manuals, instructions, procedures, policies, and other technical communication. For example, a reference guide for a stereo system or an "owner's manual" for a car is a form of documentation.

Electronic publishing — the electronic transmission of coded manuscripts, via computers and telephone lines, to a printer who processes the electronic manuscript into its final printed form. Technical communicators write and edit, using software codes, to format their manuscripts. They then use a modem and telephone lines to transmit the electronic manuscript from their computers to the printer.

Communication on-line — the telecommunication of electronic data via computers. For example, both CompuServe and Genie use on-line communication.

Desktop publishing — the process that allows a writer with a computer to draft, edit, illustrate, and print the final version of a manuscript. Although not of offset printing's technical quality, desktop publishing does expand the writer's and publisher's production choices. A simpler form of desktop publishing involves producing complete documents with a software program and a compatible laser printer.

Keyboarding — the process of entering words, illustrations, and codes into a computer for writing, designing, and publishing documents. In a sense, keyboarding replaces typing as a way of accessing a manuscript. Anytime you compose at a computer, you keyboard.

Technical Communication as Profession and Process

Technical communication is both a process for and a profession of presenting information. Professional technical communicators, graduates of "technical communication" programs, work in industry, education, government, and on a contract or freelance basis as full-time documentors. Chapters 16 and 17 examine both technical communicators' roles in industry and a firm's costs for documenting its products. On the other hand, Chapters 2, 3, and 4 emphasize technical communication as a process that most people need in their professional or personal lives to help explain new products, define technical problems, or clarify pressing community issues. Thus, everyone, not just the professional technical communicator, needs to understand how to communicate about technology and science. Whether you write as an experienced professional, an occasional author, or only an informed reader, you should know technical communication's specific requirements.

A technical communication reports facts, processes, or results of processes in terms familiar to a well-defined audience. To accomplish this, the technical communicator often uses special or distinct forms to create a visual structure for the communication. Note that this definition focuses on the information, the audience, and the form. Once a technical communicator understands the information to be presented, the writer then conducts a thorough audience analysis to determine the appropriate form, or medium, of presentation. This audience analysis may involve interviews with product users, demographic research, and even re-

FIGURE 1.1 A Tree Diagram of the Communication Process Showing That Technical Communication and the Other Disciplines Share Certain Similarities.

A TREE DIAGRAM OF THE CO. ...JNICATION PROCESS

Can you relate technical communication to the other types of writing you have studied? Perhaps you see similarities between technical communications and certain types of journalism or exposition. Maybe you have learned with surprise that technical texts rely greatly on illustrations to clarify their explanations. This tree diagram shows that the various disciplines within the field of communication, though different, share common categories. In short, .he processes of writing and speaking common tc all communication create similarities of form 1s well.

Communication

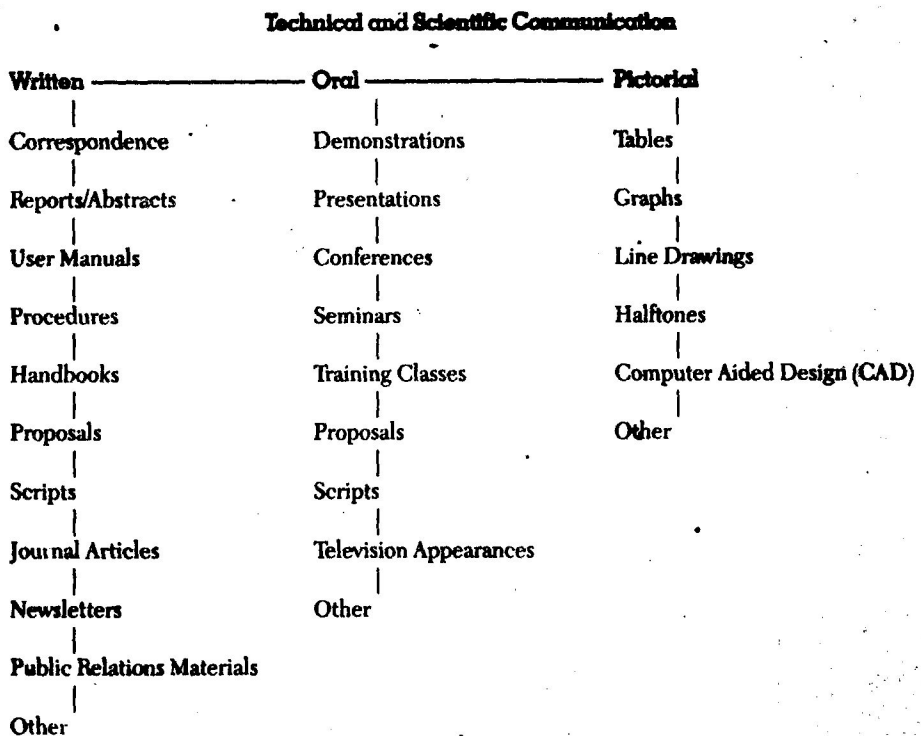| Journalistic	Expository	Creative	Technical/Scientific
Print	Books	Novels	Written
Magazines	Histories	Short Fiction	Research Documents
Newspapers	Biographies	Plays	Applications Documents
Other	Other	Poems	Other
Electronic	Journals	Other	Oral
Television			Demonstrations
Movies			Presentations
Video			Other
Other			Pictorial
			Print Graphics
			Electronic
			Other

views of the company's historical users. With this data you can select the appropriate format and structure of the actual document. Figure 1.2 shows some of the types of technical communications this text describes, as well as the audience and form of each document.

FIGURE
1.2

A Tree Diagram of the Three Categories Into Which Technical
Communication Can Be Grouped.

A TREE DIAGRAM OF TECHNICAL AND SCIENTIFIC COMMUNICATION

Perhaps in your occupation you have discovered a form of technical communication that
should be added to this classification drawing. Since the list is by no means complete, where
would you place the forms of technical communication you have defined? Note again that
the categories are not mutually exclusive; that is, a proposal may be both written and
spoken.

Technical and Scientific Communication

Written	Oral	Pictorial
Correspondence	Demonstrations	Tables
Reports/Abstracts	Presentations	Graphs
User Manuals	Conferences	Line Drawings
Procedures	Seminars	Halftones
Handbooks	Training Classes	Computer Aided Design (CAD)
Proposals	Proposals	Other
Scripts	Scripts	
Journal Articles	Television Appearances	
Newsletters	Other	
Public Relations Materials		
Other		

Characteristics of Technical Writing

Stylistic and visual cues in a text can help identify technical writing.

1. Technical writing tends toward *objectivity* in nature and tone. A technical text usually
    presents facts directly through definition, description, example, and causal analysis.

Although difficult to define, objectivity is easily identified. For example, a science period-ical may feature a story on the breakdown of steam generator tubes in American nuclear energy facilities and an anti-nuclear energy editorial. The feature story's text describes steam generator tube problems at several plants while its artwork and photographs illus-trate the inside of a tube and its construction. On the other hand, the editorial angrily de-tails the probable effects of nuclear plant breakdowns on the environment of future gen-erations of human beings. The feature article is factual and objective. However, the editorial, which may be right, uses fact, conjecture, emotion, and other techniques to argue. Its tone is not objective.

2. Technical writing often follows careful specifications. Typically, a technical writer uses a conventional report form designed by either a director of communications or a company's technical writing supervisor The form may tell the writer, based upon an audience anal-ysis, where to state experiment results, how many sentences to use in describing cost im-plications for the company, and the average number of words to use per sentence. For ex-ample, writers may use Gunning's Fog Index (shown later in this text). Writers may also compose text in conformance with a firm's design standards. Industrial psychologists and technical writers have found that guidelines for arranging a manual's content and graphics can save time and money and help ensure clarity and uniformity of image in company-disseminated information.

3. Technical writing is usually graphic writing. Technical writers often work with documen-tation groups employing graphic designers. The writers and artists use drawings, halftones, graphs, and tables as frequently as the audience's comprehension level permits. Publica-tions groups plan densely illustrated manuals, reference sheets, reports, and technical news stories to stimulate readers and to simplify verbal presentation, technology, and its applications.

4. Technical texts often exhibit a characteristic called "chunking." Chunking is the arrange-ment of text into visually separate sections emphasized by clear headings and subheadings. Borders and white spaces also show the audience the points of emphasis. These features help readers to retain new or possibly complicated information.

5. Technical writing is frequently numeric. Numbers, preferably Arabic numerals, appear often in the text. In complex technical writing for experts, numbers are presented to the last significant decimal point in complete lists, tables, and graphs.

6. Technical writing is often symbolic because mathematical and scientific symbols are fre-quently used (see Handbook for symbols). Equations, too, may appear, although appen-dices may contain the complete steps of a complicated formula.

7. Technical and scientific writing use a special vocabulary, words such as "input," "output," "software," "debit," "hypothesis," "task," "articulation," and "appliances." Attorneys, educators, engineers, scientists, and business persons all use words and figures of speech charac-teristic of their professions. If an audience is familiar with a specialized vocabulary, trade-specific words can create brevity and clarity.

8. Technical communication requires clarity because important outcomes such as human safety and equipment preservation may depend on accurate communication. Technical writers must check all facts for accuracy, include every step in a process, and be certain that a document communicates to its users.