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Technical Communication

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Strategies for Intercultural Communication

Organizing Documents for Readers from Other Cultures

Organizational patterns can vary from culture to culture. If you can, study documents written by people from the culture you are addressing to see whether they favor an organizational pattern different from the one you are considering.

- **Does the text follow expected organizational patterns?** For example, this chapter discusses the general-to-specific organization. Does the text you are studying present the specific information first?
- **Do the introductions and conclusions present the kind of information you would expect?** In the United States, main findings are often presented in the introduction. In other cultures, the main findings are not presented until late in the document.
- **Is the text organized into paragraphs?**
- **Does the text appear to be organized linearly?** Is the main idea presented first in a topic sentence or thesis statement? Does supporting information follow?
- **Does the text use headings?** If so, does it use more than one level?

If documents from the culture you plan to address are organized very differently from those you're used to seeing, take extra steps to ensure that you don't distract readers by using an unfamiliar organizational pattern.

Use Conventional Patterns of Organization

This chapter presents a number of conventional patterns of organization, such as the chronological pattern and the spatial pattern. You should begin by asking yourself whether a conventional pattern for presenting your information already exists. Using a conventional pattern makes things easier for you as a writer and for your audience.

For you, a conventional pattern serves as a template or checklist, helping you remember which information to include and where to put it. In a proposal, for example, you include a budget, which you put near the end or in an appendix. For your audience, a conventional pattern makes your document easier to read and understand. Readers who are familiar with proposals can find the information they want because you have put it where others have put similar information.

Does this mean that technical communication is merely the process of filling in the blanks? No. You need to assess the writing situation continuously as you work. If you think you could communicate your ideas better by modifying a conventional pattern or by devising a new pattern, do so. However, you gain nothing if an existing pattern would work just as well.

Display Your Organizational Pattern Prominently

Make it easy for your readers to understand the overall arrangement of your information. Displaying your organizational pattern prominently involves three main steps:

- *Creating a detailed table of contents.* If your document has a table of contents, include at least two levels of headings to help readers find the information they seek.
- *Using headings liberally.* Headings break up the text, making your page more interesting visually. They also communicate the subject of the section, improving readers' understanding.
- *Using topic sentences at the beginning of your paragraphs.* The topic sentence announces the main point of a paragraph and helps the reader understand the details that follow.

In This Book

For more about tables of contents, see Ch. 18, p. 468. For more about headings and topic sentences, see Ch. 10, pp. 206 and 210.

On TechComm Web

For a discussion of organizing information, see Paradigm Online Writing Assistant. Click on Links Library for Ch. 7 on <bedfordstmartins.com/techcomm>.

Patterns typically used in organizing information:

- Chronological
- Spatial
- General to specific
- More important to less important
- Comparison and contrast
- Classification and partition
- Problem-methods-solution
- Cause and effect

BASIC PATTERNS OF ORGANIZING INFORMATION

Every argument calls for its own organizational pattern. Figure 7.1 explains the relationship between the organizational pattern and the kind of information you are presenting.

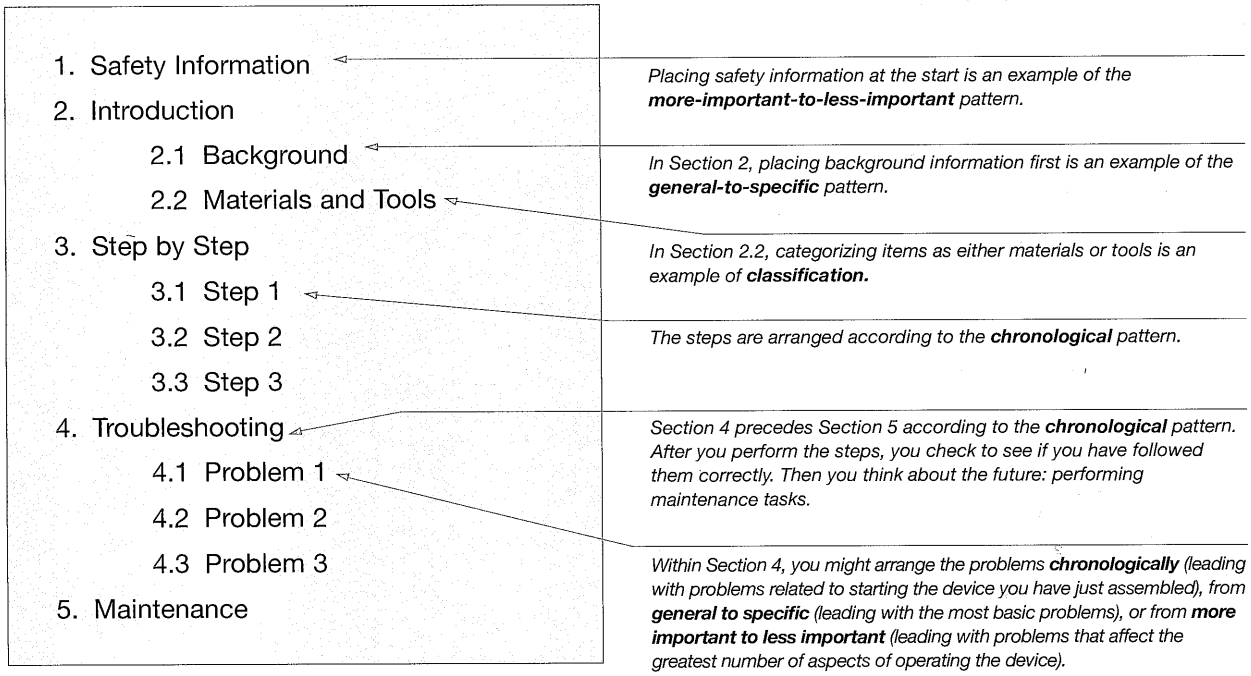
Long, complex arguments often require several organizational patterns. For instance, one part of a document might be a causal analysis of the problem you are writing about, whereas another might be a comparison and

Figure 7.1 Organizational Patterns and the Kinds of Information You Want to Present

If you want to...	*Consider using this organizational pattern*	*For example...*
Explain events that occurred or might occur or tasks the reader is to carry out	**Chronological** (p. 132). Most of the time, you present information in chronological order. Sometimes, however, you use reverse chronology.	You describe the process you used to diagnose the problem with the accounting software. Or, in a job résumé, you describe your more recent jobs before your less recent ones.
Describe a physical object or scene, such as a device or location	**Spatial** (p. 133). You choose an organizing principle such as top to bottom, east to west, or inside to outside.	You describe the three buildings that will make up the new production facility.
Explain a complex situation, such as the factors that led to a problem or the theory that underlies a process	**General to specific** (p. 133). You present general information first, then specific information. Understanding the big picture helps readers understand the details.	You explain the major changes in, and the details of, the law mandating the use of the new refrigerant in cooling systems.

Figure 7.1 *(continued)*

If you want to...	*Consider using this organizational pattern*	*For example...*
Present a set of factors	**More important to less important** (p. 135). You discuss the most important issue first, then the next most important issue, and so forth. In technical communication, you don't want to create suspense.	When you launch a new product, you discuss market niche, competition, and then pricing.
Present similarities and differences between two or more items	**Comparison and contrast** (p. 136). You choose from one of two patterns: (1) discuss all the factors related to one item, then all the factors related to the next item, and so forth; (2) discuss one factor as it relates to all the items, then another factor as it relates to all the items, and so forth.	You discuss the strengths and weaknesses of three companies bidding on a contract your company is offering.
Assign items to logical categories or discuss the elements that make up a single item	**Classification and partition** (p. 139). Classification involves placing items in categories. Partition involves breaking a single item down into its major elements.	You group the motors your company manufactures according to the fuel they burn: gasoline or diesel. Or you explain how each major component of one of your motors operates.
Discuss a problem you encountered, the steps you took to address the problem, and the outcome or solution	**Problem-methods-solution** (p. 144). You can use this pattern in discussing the past, the present, or the future. Readers understand this organizational pattern because everyone uses it every day in his or her normal routine.	In describing how your company is responding to a new competitor, you discuss the problem (the recent loss in sales), the methods (how you plan to examine your product line and business practices), and the solution (which changes will help your company remain competitive).
Discuss the factors that led to (or will lead to) a given situation or the effects that a situation led to or will lead to	**Cause and effect** (p. 145). You can start from causes and speculate about effects, or start with the effects and work backward to determine the causes.	Sales of one of your products have dipped in the last year. You want to discuss factors that you think contributed to the sales dip.



■ **Figure 7.2 Using Multiple Organizational Patterns in a Single Document**

contrast of two options for solving that problem. Figure 7.2 shows how different organizational patterns might be used in a single document.

Chronological

The chronological—or time-line—pattern commonly describes events. In an *accident report*, you describe the events in the order in which they occurred. In the background section of a *report*, you describe the events that led to the present situation. In a *reference manual*, you explain how to carry out a task by describing the steps in sequence.

Guidelines

Organizing Information Chronologically

In This Book
For more about transitions, see Ch. 10, p. 214.

- **Provide signposts.** If the passage is more than a few hundred words long, use headings. Choose words such as *step*, *phase*, *stage*, and *part*, and consider numbering them. Add descriptive phrases to focus readers' attention on the topic of the section:

  Phase One: Determining Our Objectives

  Step 3: Installing the Lateral Supports

At the paragraph and sentence levels, transitional words such as *then*, *next*, *first*, and *finally* help your readers to follow your discussion.

- **Consider using graphics to complement the text.** Flowcharts, in particular, help you emphasize chronological passages for all kinds of readers, from the expert to the general reader.
- **Analyze events where appropriate.** When you use chronology, you are explaining what happened in what sequence, but you are not necessarily explaining why or how an event happened or what it means. For instance, the largest section of an accident report is usually devoted to the chronological discussion, but the report is of little value unless it explains what caused the accident, who bears responsibility, and how such accidents can be prevented.

In This Book

For more about graphics, see Ch. 13.

Spatial

The spatial pattern is commonly used to describe objects and physical sites. In an *accident report*, you describe the physical scene of the accident. In a *feasibility study* about building a facility, you describe the property on which it would be built. In a *proposal* to design a new microchip, you describe the layout of the new chip.

Guidelines

Organizing Information Spatially

- **Provide signposts.** Help your readers follow the argument by using words and phrases that indicate location (*to the left*, *above*, *in the center*) in headings, topic sentences, and support sentences.
- **Consider using graphics to complement the text.** Diagrams, drawings, photographs, and maps clarify spatial relationships.
- **Analyze events where appropriate.** A spatial arrangement doesn't explain itself; you have to do the analysis: a diagram of a floor plan cannot explain why the floor plan is effective or ineffective.

Figure 7.3 on page 134 shows the use of both chronological and spatial organization of information.

On TechComm Web

To view Fig. 7.3 in context on the Web, click on Links Library for Ch. 7 on <bedfordstmartins.com/techcomm>.

General to Specific

The general-to-specific pattern is used when readers need a general understanding of a subject before they can understand and remember the details. For example, in a *report*, you include an executive summary—an overview for managers—before the body of the report. In a set of *instructions*, you

This screen from the Metropolitan Museum of Art's Timeline of Art History is arranged using both chronological and spatial organization.

*The viewer is looking at the portion of the exhibit that covers the years 1600 to 1800 (**chronological**).*

*Each of the graphics is a link to the portion of the exhibit that covers art from that region of the world (**spatial**).*

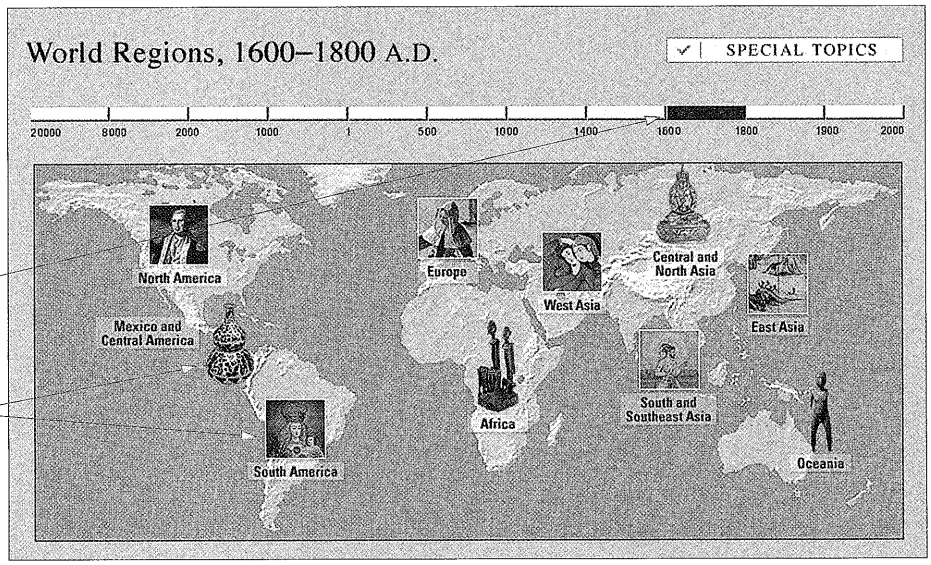


Figure 7.3 Information Organized Chronologically and Spatially
Source: Metropolitan Museum of Art, 2005 <www.metmuseum.org/toah/hm/09/hm09.htm>.

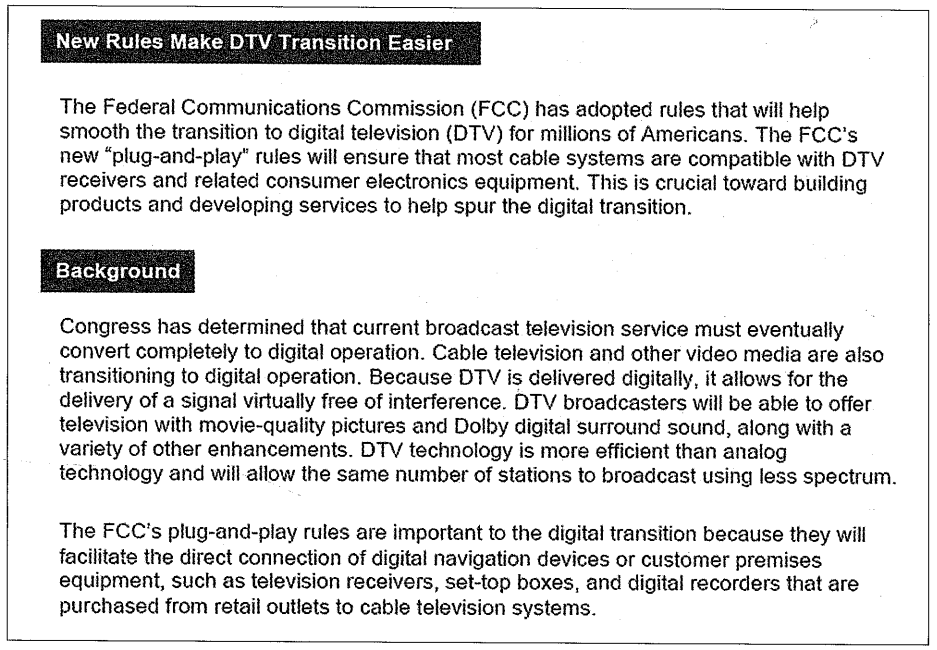
provide general information about the necessary tools and materials and about safety measures before providing the step-by-step instructions. In a *memo*, you present the background information before going into the details.

Guidelines

Organizing Information from General to Specific

- **Provide signposts.** Explain that you will address general issues first and then move on to specific concerns. If appropriate, incorporate the words *general* and *specific* or other relevant terms into the major headings or at the start of the text for each item you are describing.
- **Consider using graphics to complement the text.** Diagrams, drawings, photographs, and maps help your readers understand the general or fine points of the information.

Figure 7.4 is an example of how to organize information from general to specific. This passage begins the consumer fact sheet "Compatibility of Cable TV and Digital TV Receivers—'Plug-and-Play,'" from the Federal Communications Commission (FCC).



New Rules Make DTV Transition Easier

The Federal Communications Commission (FCC) has adopted rules that will help smooth the transition to digital television (DTV) for millions of Americans. The FCC's new "plug-and-play" rules will ensure that most cable systems are compatible with DTV receivers and related consumer electronics equipment. This is crucial toward building products and developing services to help spur the digital transition.

Background

Congress has determined that current broadcast television service must eventually convert completely to digital operation. Cable television and other video media are also transitioning to digital operation. Because DTV is delivered digitally, it allows for the delivery of a signal virtually free of interference. DTV broadcasters will be able to offer television with movie-quality pictures and Dolby digital surround sound, along with a variety of other enhancements. DTV technology is more efficient than analog technology and will allow the same number of stations to broadcast using less spectrum.

The FCC's plug-and-play rules are important to the digital transition because they will facilitate the direct connection of digital navigation devices or customer premises equipment, such as television receivers, set-top boxes, and digital recorders that are purchased from retail outlets to cable television systems.

The first paragraph is the most general, explaining the government's decision to help spread the use of digital television and the relationship between plug-and-play and cable systems.

The background section explains more specifically why Congress has mandated the shift from analog to digital television.

Finally, this paragraph presents more specific information on the purpose of plug-and-play rules.

■ **Figure 7.4 Information Organized from General to Specific**
Source: U.S. Federal Communications Commission, 2004 <http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-238865A1.pdf>.

More Important to Less Important

The more-important-to-less-important pattern recognizes that readers often want the bottom line—the most important information—first. For example, in an *accident report*, you describe the three most important factors that led to the accident before describing the less-important factors. In a *feasibility study* about building a facility, you present the major reasons that the site is appropriate, then the minor reasons. In a *proposal* to design a new microchip, you describe the major applications for the new chip, then the minor applications.

Although the more-important-to-less-important pattern works well in most documents, sometimes other patterns work better. People who write for readers outside their own company often reverse the more-important-to-less-important pattern because they want to make sure their audience reads the whole discussion. This pattern is also popular with writers who are delivering bad news. For instance, if you want to justify recommending that your organization *not* go ahead with a popular plan, the reverse sequence lets you explain the problems with the popular plan before you present the plan you recommend. Otherwise, readers might start to formulate objections before you have had a chance to explain your position.

Guidelines

Organizing Information from More Important to Less Important

- **Provide signposts.** Tell your readers how you are organizing the passage. For instance, in the introduction to a proposal to design a new microchip, you might write, "The three applications for the new chip, each of which is discussed below, are arranged from most important to least important."

  In assigning signposts, be straightforward. If you have two very important points and three less-important points, present them that way. Group the two important points and label them, as in "Major Reasons to Retain Our Current Management Structure." Then present the less-important factors as "Other Reasons to Retain Our Current Management Structure." Being straightforward makes the material easier to follow and enhances your credibility.

- **Explain why one point is more important than another.** Don't just say that you will be arranging the items from more important to less important. Explain why the more important point is more important.

- **Consider using graphics to complement the text.** Diagrams and numbered lists often help to suggest levels of importance.

Figure 7.5 shows the more-important-to-less-important organizational structure.

Comparison and Contrast

Typically, the comparison-and-contrast pattern is used to describe and evaluate two or more items or options. For example, in a *memo*, you compare and contrast the credentials of three finalists for a job. In a *proposal* to design a new microchip, you compare and contrast two different strategies for designing the chip. In a *feasibility report* describing a legal challenge that your company faces, you compare and contrast several options for responding.

In This Book
For more about feasibility reports, see Ch. 18, p. 459.

The first step in comparing and contrasting two or more items is to determine the *criteria*: the standards or needs you will use in studying the items. For example, a professional musician who plays a piano in restaurants might be looking to buy a new portable keyboard. She might compare and contrast available instruments using the number of keys as one criterion. For this person, 88 keys would be better than 64. Another criterion might be weight. A keyboard that weighs 25 pounds would be better than one that weighs 46 pounds.

Almost always, you will need to consider several or even many criteria. Start by deciding whether the criterion represents a necessary quality or merely a desirable one. In studying keyboards, for instance, the number of keys might be a necessary quality. If you need an 88-key instrument to play your music, you are not going to consider any instruments without 88 keys. The same thing might be true of touch-sensitive keys. But a MIDI interface

Infinity Software
3200 Industrial Parkway, Dallas, TX 75201, 972-555-3278

To: Customer Service Staff
From: Larry Jenkins, Director
Subject: A Three-Point Program to Improve Service
Date: June 19, 2006

In this memo, I want to introduce a new program that I hope will help us improve our customer service.

As you know, our most significant goal for this year has been to improve our customer service. Over the past six weeks, we have attempted to learn what our customers expect—and demand—in the service they receive. Toward that end, we have attended numerous conferences and conducted many focus groups.

What we have learned from recent conferences of semiconductor purchasers and from the focus groups is that customers expect and demand better service than the industry currently provides. By better service I don't mean merely returning phone calls. I mean something much more ambitious and difficult to attain: helping our customers do their jobs by anticipating and addressing their total needs. For this reason, I have formed a Customer Satisfaction Panel, chaired by Maureen Bedrich, whose job will be to develop policies that will enable us to improve the quality of the service we offer our customers.

I have asked the panel, under Maureen Bedrich's direction, to consider three major areas:
- improving the ease of use of our equipment
- improving preventive and corrective maintenance
- improving our compatibility with other vendors' products

Improving the Ease of Use of Our Equipment
User friendliness is the most important area we need to improve, because it affects our customers during the entire lifetime of the product. When we deliver a new product, we have to sit down with the customers and explain how to integrate it into their manufacturing processes. This session is time-consuming and costly for us and for them. Therefore, we must explore the option of automating it.

Improving Preventive and Corrective Maintenance
The second most important area for study is improving preventive and corrective maintenance. Our customers will no longer tolerate down times approaching 10 percent; they will accept no more than 2 percent to 3 percent. Preventive maintenance is critical in our industry because gases used in vapor-deposition systems periodically have to be removed from the inside of the equipment. Customers want to be able to plan for these stoppages to reduce costs. Currently, we have no means of helping them do so.

Improving Our Compatibility with Other Vendors' Products
Finally, we have to accept the fact that because no one in our industry is likely to control the market, we have to make our products more compatible with those of other manufacturers. This means that we must be willing to put our people on-site to see what the customers' setup is and help them determine how to modify our product to fit in efficiently. We can no longer offer a "take-it-or-leave-it" product.

I hope you will extend every effort to work constructively with Maureen and her committee over the coming months to ensure that we improve the overall service we offer our customers.

This excerpt is from a memo written by an executive at a company that sells equipment used in manufacturing semiconductors.

The writer states his organizational pattern in the topic sentence and explains why this first area is the most important one he will discuss.

The writer again indicates his organizational pattern.

Figure 7.5 Information Organized from More Important to Less Important

The whole-by-whole pattern provides a coherent picture of each option: the 5L and the 6L. This pattern works best if your readers need an overall assessment of each option, or if each option is roughly equivalent according to the criteria.

Whole by whole	*Part by part*
Model 5L • price • resolution • print speed	Price • Model 5L • Model 6L
Model 6L • price • resolution • print speed	Resolution • Model 5L • Model 6L
	Print speed • Model 5L • Model 6L

The part-by-part pattern lets you focus your attention on the criteria. If, for instance, Model 5L produces much better resolution than Model 6L, the part-by-part pattern reveals this difference more effectively than the whole-by-whole pattern does. The part-by-part pattern is best for detailed comparisons and contrasts.

might be less important—a merely desirable quality: you would like MIDI capability, but you would not eliminate an instrument from consideration just because it doesn't have MIDI.

Two typical patterns for organizing a comparison-and-contrast discussion are *whole by whole* and *part by part*. The table above illustrates the difference between them. In this table, two printers—Model 5L and Model 6L—are being compared and contrasted according to three criteria: price, resolution, and print speed.

You can have it both ways. If you want to use a part-by-part pattern to emphasize particular aspects, you can begin the discussion with a general description of the various items. Once you have chosen the overall pattern—whole by whole or part by part—you can decide how to organize the second-level items. That is, in a whole-by-whole passage, you have to sequence the "aspects"; in a part-by-part passage, you have to sequence the "options."

Guidelines

Organizing Information by Comparison and Contrast

- **Establish criteria for the comparison and contrast.** Choose criteria that are consistent with the needs of your audience.
- **Evaluate each item according to the criteria you have established.** Draw your conclusions.
- **Organize the discussion.** Choose either the *whole-by-whole* or *part-by-part* pattern, or some combination of the two. Then organize the second-level items.
- **Consider using graphics to complement the text.** Graphics can clarify and emphasize comparison-and-contrast passages. Diagrams, drawings, and tables are common ways to provide such clarification and emphasis.

Ethics Note

Comparing and Contrasting Fairly

Because the comparison-and-contrast organizational pattern is used frequently in evaluating items, it appears often in product descriptions as part of the argument that one company's products are better than another's. There is nothing unethical in this. But it is unethical to misrepresent items, such as when a writer portrays his own product as better than it is or a competitor's as worse than it is. Obviously, lying about a product is unethical.

But some practices are not so easy to characterize. For example, your company makes laptop computers. Your chief competitor's model has a longer battery life than yours. In comparing and contrasting the two laptops, are you ethically obligated to mention battery life? No, you are not. If readers are interested in battery life, they are responsible for figuring out what your failure to mention battery life means and for seeking further information from other sources. However, if you do mention battery life, you must do so honestly, using industry-standard techniques for measuring it. You cannot measure your laptop's battery life under one set of conditions and your competitor's under another set.

Figure 7.6 on page 140 shows a comparison-and-contrast passage organized according to the whole-by-whole pattern.

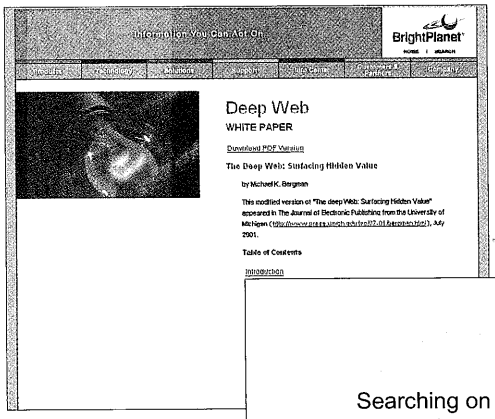
Classification and Partition

Classification is the process of assigning items to categories. For instance, all the students at a university could be classified by sex, age, major, and many other characteristics. You can also create subcategories within categories, such as males and females majoring in business.

Classification is common in technical communication. In a *feasibility study* about building a facility, you classify sites into two categories: domestic and foreign. In a *journal article* about ways to treat a medical condition, you classify the treatments as surgical and nonsurgical. In a description of a major in a *college catalog*, you classify courses as required or elective.

Partition is the process of breaking a unit into its components. For example, a stereo system could be partitioned into the following components: CD player, tuner, amplifier, and speakers. Each component is separate, but together they form a whole stereo system. Each component can, of course, be partitioned further.

Partition is used in descriptions of objects, mechanisms, and processes (see Chapter 9). In an *equipment catalog*, you use partition to describe the major components of one of your products. In a *proposal*, you use partition to present a detailed description of an instrument being proposed for



This passage from BrightPlanet compares and contrasts searching the surface Web and searching the deep Web.

The first paragraph uses a metaphor of dragging a net to introduce the main difference between the surface Web and the deep Web.

The two remaining paragraphs are organized according to the whole-by-whole pattern. The first of the two paragraphs is devoted to traditional search engines that search the surface Web. The second highlights the company's new search engine, which searches the deep Web.

Searching on the Internet today can be compared to dragging a net across the surface of the ocean. While a great deal may be caught in the net, there is still a wealth of information that is deep, and therefore, missed. The reason is simple: Most of the Web's information is buried far down on dynamically generated sites, and standard search engines never find it.

Traditional search engines create their indices by spidering or crawling surface Web pages. To be discovered, the page must be static and linked to other pages. Traditional search engines cannot "see" or retrieve content in the deep Web—those pages do not exist until they are created dynamically as the result of a specific search. Because traditional search engine crawlers cannot probe beneath the surface, the deep Web has heretofore been hidden.

The deep Web is qualitatively different from the surface Web. Deep Web sources store their content in searchable databases that only produce results dynamically in response to a direct request. But a direct query is a "one at a time" laborious way to search. BrightPlanet's search technology automates the process of making dozens of direct queries simultaneously using multiple-thread technology and thus is the only search technology, so far, that is capable of identifying, retrieving, qualifying, classifying, and organizing both "deep" and "surface" content.

Figure 7.6 Information Organized by Comparison and Contrast
Source: Based on Bergman, 2004 <www.brightplanet.com/technology/deepweb.asp>.

INTERACTIVE SAMPLE DOCUMENT

Comparing and Contrasting Honestly

This comparison-and-contrast table is from the Web site of the manufacturer of an orthodontic product called Invisalign. The questions in the margin ask you to think about the ethics of the table. E-mail your responses to yourself and/or your instructor, and see suggested responses on TechCommWeb.

» Product Comparison

Printer Friendly

Find Experienced Invisalign Doctors in Your Area

Learn More »

The Invisalign technology has allowed me to have discreet and effective orthodontic treatment.
-Allison, Ozawkie, KS

Product Comparison Chart

Take a look at the chart below to see how Invisalign compares to other treatment options. Considering that the average treatment time for an Invisalign patient is generaly about a year, the choice is clear—Invisalign.

	Invisalign®	Metal Braces	Veneers
How Does It Work?	Invisalign® uses a series of clear removable aligners to straighten your teeth without metal wires or brackets.	Metal braces use wires and brackets to pressure your teeth into straighter alignment.	Laminates that are bonded to teeth to cover up imperfections.
Invisible	Yes	No	n/a
Removable	Yes	No	n/a
Comfortable	Yes	No	n/a
No metal or brackets to irritate your mouth	Yes	No	n/a
Does not require grinding to remove tooth enamel	Yes	Yes	No
Does not require costly replacement	Yes	n/a	No
Able to brush and floss normally during treatment	Yes	No	n/a

Source: Invisalign, 2005 <www.invisalign.com/generalapp/us/en/for/compare.jsp>.

1. Is it unethical for the company to present the column on its product before the columns on metal braces and veneers?
2. Some of the criteria, such as "removable," are based on factual claims. That is, the three technologies are either removable or not. But some of the other criteria are based on opinions, not facts. Identify one criterion that is based on opinions, then determine whether the use of that criterion is fair.
3. Is the criterion "No metal or brackets to irritate your mouth" a fair criterion to present in this table? Why or why not?
4. The text above the table discusses the average treatment time for Invisalign. Why isn't that criterion included in the table itself? Is it unethical not to include it in the table?

On TechComm Web

To e-mail your responses to yourself and/or your instructor and to see suggested responses, click on Interactive Sample Documents for Ch. 7 on <bedfordstmartins.com/techcomm>.

development. In a *brochure*, you describe how to operate a product by describing each of its features.

Guidelines

Organizing Information by Classification or Partition

- **Choose a basis of classification or partition that fits your audience and purpose.** If you are writing a warning about snakes for hikers in a particular state park, your basis of classification will probably be whether the snakes are poisonous. You will describe all the poisonous snakes, then all the nonpoisonous ones.
- **Use only one basis of classification or partition at a time.** If you are classifying graphics programs according to their technology—paint programs and draw programs—do not include another basis of classification, such as cost.
- **Avoid overlapping.** In classifying, make sure that no single item could logically be placed in more than one category. In partitioning, make sure that no listed component includes another listed component. Overlapping generally occurs when you change the basis of classification or the level at which you are partitioning a unit. In the following classification of bicycles, for instance, the writer introduces a new basis of classification that results in overlapping categories:

  —mountain bikes

  —racing bikes

  —touring bikes

  —ten-speed bikes

  The first three items share a basis of classification: the general category of bicycle. The fourth item has a different basis of classification: number of speeds. Adding the fourth item is illogical because a particular ten-speed bike could be a mountain bike, a racing bike, or a touring bike.
- **Be inclusive.** Include all the categories necessary to complete your basis of classification. For example, a partition of an automobile by major systems would be incomplete if it included the electrical, fuel, and drive systems but not the cooling system. If you decide to omit a category, explain why.
- **Arrange the categories in a logical sequence.** Use a reasonable plan: chronology (first to last), spatial development (top to bottom), importance (most important to least important), and so on.
- **Consider using graphics to complement the text.** Organization charts are commonly used in classification passages; drawings and diagrams are often used in partition passages.

In Figure 7.7, a discussion of nondestructive testing techniques, the writer uses classification effectively in introducing nondestructive testing to a technical audience.

TYPES OF NONDESTRUCTIVE TESTING

Nondestructive testing of structures permits early detection of stresses that can cause fatigue and ultimately structural damage. The least sensitive tests isolate macrocracks. More sensitive tests identify microcracks. The most sensitive tests identify slight stresses. All sensitivities of testing are useful because some structures can tolerate large amounts of stress — or even cracks — before their structural integrity is threatened.

Currently there are four techniques for nondestructive testing, as shown in Figure 1. These techniques are presented from least sensitive to most sensitive.

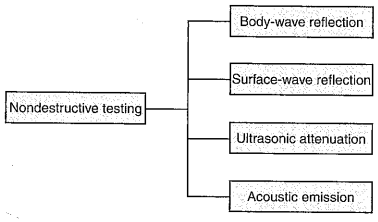


Figure 1. Types of Nondestructive Testing

Body-Wave Reflection

In this technique, a transducer sends an ultrasonic pulse through the test material. When the pulse strikes a crack, part of the pulse's energy is reflected back to the transducer. Body-wave reflection cannot isolate stresses: the pulse is sensitive only to relatively large cracks.

Surface-Wave Reflection

The transducer generates an ultrasonic pulse that travels along the surface of the test material. Cracks reflect a portion of the pulse's energy back to the transducer. Like body-wave reflection, surface-wave reflection picks up only macrocracks. Because cracks often begin on interior surfaces of materials, surface-wave reflection is a poor predictor of serious failures.

Ultrasonic Attenuation

The transducer generates an ultrasonic pulse either through or along the surface of the test material. When the pulse strikes cracks or the slight plastic deformations associated with stress, part of the pulse's energy is scattered. Thus, the amount of the pulse's energy decreases. Ultrasonic attenuation is a highly sensitive method of nondestructive acoustic testing.

There are two methods of ultrasonic attenuation. One technique reflects the pulse back to the transducer. The other uses a second transducer to receive the pulses sent through or along the surface of the material.

Acoustic Emission

When a test specimen is subjected to a great amount of stress, it begins to emit waves; some are in the ultrasonic range. A transducer attached to the surface of the test specimen records these waves. Current technologies make it possible to interpret these waves accurately for impending fatigue and cracks.

Figure 7.7 Information Organized by Classification and Subclassification

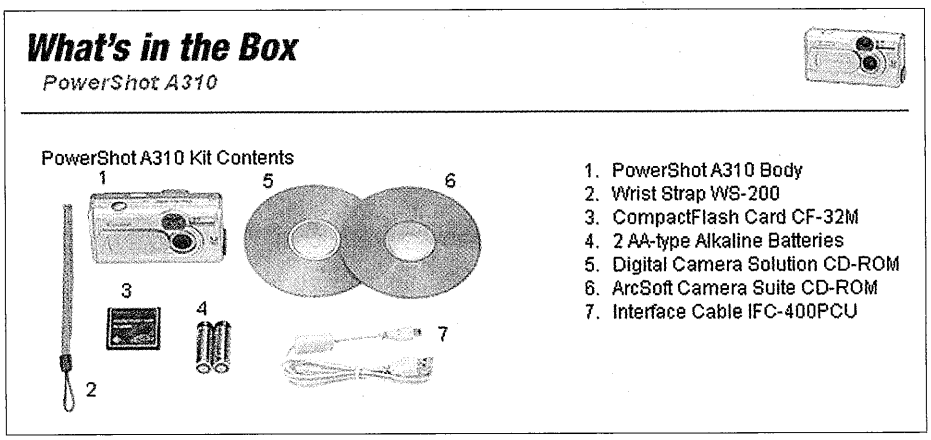
The writer classifies nondestructive testing into four categories.

Notice that the writer clearly explains the sequence of the document's organization.

This simple block diagram helps the readers get an overview of the subject.

Here the writer introduces a second level of classification.

This "kit contents" page from a user's manual for a camera partitions the kit into its components. The manual then discusses each component.



■ **Figure 7.8 Information Organized by Partition**
Source: Canon, 2005 <http://consumer.usa.canon.com/ir/controller?act=BoxContentsAct&fcategoryid=145&modelid=9829>.

Figure 7.8 is an example of partition. For more examples of partition, see Chapter 9, which includes descriptions of objects, mechanisms, and processes (page 187).

Problem-Methods-Solution

The problem-methods-solution pattern reflects the logic used in carrying out a project. The three components of this pattern are simple to identify:

- *Problem.* A description of what was not working (or not working effectively) or what opportunity exists for improving current processes.
- *Methods.* The procedure performed to confirm the analysis of the problem, solve the problem, or exploit the opportunity.
- *Solution.* The statement of whether the analysis of the problem was correct or what was discovered or devised to solve the problem or capitalize on the opportunity.

The problem-methods-solution pattern is common in technical communication. In a *proposal*, you describe a problem in your business, how you plan to carry out your research, and how your deliverable (an item or a report) can help solve the problem. In a *completion report* about a project to improve a manufacturing process, you describe the problem that motivated the project, the methods you used to carry out the project, and the findings: the results, conclusions, and recommendations.

Guidelines

Organizing Information by Problem-Methods-Solution

- **In describing the problem, be clear and specific.** Don't write "Our energy expenditures are getting out of hand." Instead, write "The energy usage has increased 7 percent in the past year, while utility rates have risen 11 percent." Then calculate the total increase in energy costs.
- **In describing your methods, help your readers understand what you did and why you did it that way.** You might need to justify your choices. Why, for example, did you use a *t*-test in calculating the statistics in an experiment? If you can't defend your choice, you lose credibility.
- **In describing the solution, don't overstate.** Avoid overly optimistic claims, such as "This project will increase our market share from 7 percent to 10 percent within 12 months." Instead, be cautious: "This project could increase our market share from 7 percent to 10 percent." That way, you won't be embarrassed if things don't turn out as well as you had hoped.
- **Choose a logical sequence.** The most common sequence is to start with the problem and conclude with the solution. However, different sequences work equally well as long as you provide a preliminary summary to give readers an overview and provide headings or some other design elements (see Chapter 12) to help readers find the information they want. For instance, you might want to put the methods last if you think your readers already know them or are more interested in the solution.
- **Consider using graphics to complement the text.** Graphics, such as flowcharts, diagrams, and drawings, can clarify problem-methods-solution passages.

The example of the problem-methods-solution argument in Figure 7.9 on page 146 is based on a discussion about improving child safety in automobiles.

Cause and Effect

Technical communication often involves cause-and-effect discussions. Sometimes you will reason forward, from cause to effect. If we raise the price of a particular product we manufacture (cause), what will happen to our sales (effect)? Sometimes you will reason backward, from effect to cause. Productivity went down by 6 percent in the last quarter (effect); what factors led to this decrease (causes)? Cause-and-effect reasoning, therefore, provides a way to answer the following two questions:

- What will be the effect(s) of X?
- What caused X?

CHILD RESTRAINT LAWS

The writer uses statistics and examples to define the problem of child safety in automobiles.

The Problem

A 1996 Safety Board child-passenger safety study involving more than 180 restrained children showed that the children tended to be restrained in systems too advanced for their physical development. For example, the report showed that 52 children used vehicle seat belts when they should have been placed in child restraint systems or booster seats.

The results can be tragic. In the summer of 1996 in Washington State, a 4-year-old, 45-pound boy was buckled into a lap/shoulder belt by his mother in accordance with State law. When their sport utility vehicle rolled over in a violent crash, the boy's lap/shoulder belt remained buckled, but the young boy was ejected from the restraint and the car, and killed.

The Centers for Disease Control and Prevention (CDC) issued a report in February 1999 indicating that 4- through 8-year-olds are not being protected because of gaps in the State laws that govern child safety seats. As a result, the CDC estimates that almost 500 children die on our highways every year because they are not properly secured in restraint systems — booster seats — that are appropriate for their age, height, and weight.

Twenty-eight States and the District of Columbia require children of all ages (infants through teenagers) to be buckled up, although most permit seat belts to be substituted for child safety seats or booster seats. Only eight States require all children age 4 and under to be in child safety seats.

In addition, 6 out of 10 children killed in traffic crashes are not buckled up at all. The number of children killed each year could be reduced by 50 percent if every child were buckled up. There should be no tolerance for unbuckled children. State child restraint laws should be enforced and supported to reduce the number of children killed and injured in traffic crashes.

The writer describes the actions taken by the Safety Board—the methods—to combat the problem described earlier in the discussion.

What We Are Doing

Although all 50 States and the District of Columbia have child passenger protection laws, in 1996, the Safety Board called on the States to strengthen their child restraint laws to do the following:

- Require all children under 4 years old to be in child safety seats.
- Require that 4- to 8-year-old children use auto safety booster seats.
- Eliminate provisions that permit children under 8 years old to be buckled up in a seat belt.
- Require all children under age 13 to ride in the back seat, if a seat is available.

The writer describes the "solution": the results of the efforts made by the Safety Board. Naturally, the solutions do not completely fix the problem, but they represent progress.

Safety Improvements

We are starting to see States take positive steps to improve child safety in automobiles. As a result of the Safety Board's urging, the following actions were taken:

- Washington State and California enacted laws in 2000 to require children under 6 years of age or 60 pounds to ride in a booster seat.
- Delaware, North Carolina, and Rhode Island now require children to ride in the back seat of air bag–equipped cars. In Louisiana, all children less than 13 years of age must ride in the rear seat when one is available.

The Safety Board recently began an education campaign "Boost 'em before you Buckle 'em" to ensure that 4- to 8-year-olds get buckled up in age-appropriate restraint systems.

Our efforts at educating state legislatures and executives continue, but we are beginning to see real progress in protecting America's most vulnerable automobile passengers.

■ Figure 7.9 Information Organized by the Problem-Methods-Solution Pattern

Source: National Transportation Safety Board, 2000 <www.ntsb.gov/Publictn/2000/SR0002.pdf>.

Arguments organized by cause and effect are common in technical communication. In an *environmental impact statement*, you argue that a proposed construction project would have three important effects on the ecosystem. In the recommendation section of a *report*, you argue that a recommended solution would improve operations in two major ways. In a *memo*, you describe a new policy, then explain the effects you anticipate the policy will have.

Cause-and-effect relationships are difficult to describe because there is no scientific way to determine causes or effects. You draw on your common sense and your knowledge of your subject. When you try to determine, for example, why the product you introduced last year failed to sell, you start with the obvious possibilities: the market was saturated, the product was of low quality, the product was poorly marketed, and so forth. The more you know about your subject, the more precise and insightful your analysis will be.

A causal discussion can never be certain. You cannot *prove* why a product failed in the marketplace. But you can explain why you think the causes or effects you are identifying are the most plausible ones. For instance, to make a plausible case that the main reason is that it was poorly marketed, you can show that, in the past, your company's other unsuccessful products were marketed in similar ways and that your company's successful products were marketed in other ways.

Guidelines

Organizing Information by Cause and Effect

- **Explain your reasoning.** To support your claim that the product was marketed poorly, use specific facts and figures: the low marketing budget, delays in beginning the marketing campaign, and so forth.
- **Avoid overstating your argument.** For instance, if you write that Steve Jobs, the founder of Apple, "created the computer revolution," you are claiming too much. It is better to write that Steve Jobs "was one of the central players in creating the computer revolution."
- **Avoid logical fallacies.** Logical fallacies, such as hasty generalizations or *post-hoc* reasoning, can also undermine your discussion.
- **Consider using graphics to complement the text.** Graphics, such as flowcharts, organization charts, diagrams, and drawings, can clarify and emphasize cause-and-effect passages.

In This Book

For more about logical fallacies, see Ch. 8, p. 163.

Figure 7.10 on page 148 illustrates an effective cause-and-effect argument.

This excerpt from a white paper on energy policy presents two cause-and-effect arguments.

Section 1.7 argues that global warming has already led to the problems cited in the bulleted list.

Section 1.8 argues that if global warming continues, the results could be widespread and costly. Note that the authors make clear that they cannot speak with certainty about the future; they can only speculate based on today's best science.

1.7 The rise in temperatures has been accompanied by changes in the world around us:

- ice caps are retreating from many mountain peaks like Kilimanjaro;
- global mean sea level rose by an average of 1–2mm a year during the 20th century;
- summer and autumn arctic sea ice has thinned by 40% in recent decades;
- global snow cover has decreased by 10% since the 1960s;
- El Nino events have become more frequent and intense during the last 20–30 years;
- usage of the Thames Barrier has increased from once every two years in the 1980s to an average six times a year over the past 5 years; and
- weather-related economic losses to communities and businesses have increased tenfold over the last 40 years.

1.8 In this century, without action to reduce emissions, the earth's temperature is likely to rise at a faster rate than any time in the last 10,000 years or more. In the UK, the risks of droughts and flooding are likely to increase. Sea levels will rise, so that extreme high water levels could be 10 to 20 times more frequent at some parts of the east coast by the end of the century. Worldwide, the consequences could be devastating, especially in the developing world where many millions more people are likely to be exposed to the risk of disease, hunger and flooding. In addition, there is a risk of large scale changes such as the shut-down of the Gulf Stream or melting of the West Antarctic ice sheet, which although they may have a very low probability of occurring, would have dramatic consequences.

Figure 7.10 A Discussion Organized by the Cause-and-Effect Pattern
Source: United Kingdom Department of Trade and Industry, 2003 <www.dti.gov.uk/energy/whitepaper/wp_text.pdf>.

Writer's Checklist

Did you

- ☐ analyze your audience and purpose? (p. 128)
- ☐ consider using a conventional pattern of arrangement? (p. 129)
- ☐ display your organization prominently by
  - ☐ creating a detailed table of contents? (p. 130)
  - ☐ using headings liberally? (p. 130)
  - ☐ using topic sentences at the beginnings of your paragraphs? (p. 130)

The following checklists cover the eight organizational patterns discussed in this chapter.

Chronological and Spatial

Did you

- ☐ provide signposts, such as headings or transitional words or phrases? (p. 132)
- ☐ consider using graphics to complement the text? (p. 133)
- ☐ analyze events where appropriate? (p. 133)

General to Specific

Did you

- ☐ provide signposts, such as headings or transitional words or phrases? (p. 134)
- ☐ consider using graphics to complement the text? (p. 134)

More Important to Less Important

Did you

- ☐ provide signposts, explaining clearly that you are using this organizational pattern? (p. 136)
- ☐ make clear why the first point is the most important, the second is the second most important, and so forth? (p. 136)
- ☐ consider using graphics to complement the text? (p. 136)

Comparison and Contrast

Did you

- ☐ establish criteria for the comparison and contrast? (p. 136)
- ☐ choose a structure—whole by whole or part by part—that is most appropriate for your audience and purpose? (p. 138)
- ☐ choose appropriate organizational patterns for your second-level items? (p. 138)
- ☐ consider using graphics to complement the text? (p. 138)

Classification and Partition

Did you

- ☐ choose a basis consistent with the audience and purpose of the document? (p. 142)
- ☐ use only one basis at a time? (p. 142)
- ☐ avoid overlapping? (p. 142)
- ☐ include all the appropriate categories? (p. 142)
- ☐ arrange the categories in a logical sequence? (p. 142)
- ☐ consider using graphics to complement the text? (p. 142)

Problem-Methods-Solution

Did you

- ☐ describe the problem clearly and specifically? (p. 145)
- ☐ if appropriate, justify your methods? (p. 145)
- ☐ avoid overstating your solution? (p. 145)
- ☐ arrange the discussion in a sequence consistent with the audience and purpose of the document? (p. 145)
- ☐ consider using graphics to complement the text? (p. 145)

Cause and Effect

Did you

- ☐ explain your reasoning? (p. 147)
- ☐ avoid overstating your argument? (p. 147)
- ☐ avoid logical fallacies? (p. 147)
- ☐ consider using graphics to complement the text? (p. 147)

Exercises

1. **INTERNET EXERCISE** Using a search engine, find the Web site of a company that makes a product used by professionals in your field (personal computers are a safe choice). Locate three discussions on the site. For example, there will probably be the following: a passage devoted to ordering a product from the site (using a chronological pattern), a description of a product (using a partition pattern), and a passage describing why the company's products are superior to those of its competitors (using a comparison-and-contrast argument). Print a copy of the passages you've identified.

2. For each of the lettered topics that follow, identify the best organizational pattern for a discussion of the subject. For example, a discussion of distance education and on-campus courses could be organized using the comparison-and-contrast pattern. Write a brief explanation about why this would be the best organizational pattern to use. (Use each of the organizational patterns discussed in this chapter at least once.)
   a. how to register for courses at your college or university
   b. how you would propose reducing the time required to register for classes or to change your schedule
   c. your car's dashboard
   d. the current price of gasoline
   e. advances in manufacturing technology
   f. the reasons you chose your college or major
   g. a student organization on your campus
   h. the tutorials that come with two different software programs
   i. personal computers
   j. how you would propose increasing the ties between your college or university and local business and industry
   k. college courses
   l. increased security in airports
   m. the room in which you are sitting
   n. the three most important changes you would like to see at your school
   o. a guitar
   p. cooperative education and internships for college students
   q. digital and film photography
   r. how to prepare for a job interview
3. Write a 500-word discussion of one of the lettered topics in Exercise 2. If appropriate, include graphics. Preface your discussion with a sentence explaining the audience and purpose of the discussion.

Case 7: Organizing a Document

In This Book For more about memos, see Ch. 14, p. 352. For more about interviews, see Ch. 6, p. 114.

Background

"One of the first items on my agenda is to write an internship handbook," Georgia McCallum told the group seated around the conference table. This was the first meeting of the Internship Working Group. Georgia, the newly hired university internship director, had assembled the group to review current practices for academic internships and to create reasonable, consistent university-wide standards for academic internships. Attending the meeting were Professors Leandra Lucas and Rick Burtt. Leandra Lucas serves as the internship coordinator for the School of Engineering; Rick Burtt coordinates internships for the Department of Kinesiology. You were invited to participate as a student representative.

"One of the things I learned when I interviewed all the internship coordinators this fall was that internship standards tend to be set by individual departments," Georgia explained. "I also learned that new internship coordinators don't have much guidance or resources. They don't know what options they have in regard to working with student interns and the sponsoring organizations. The result is an inconsistent internship experience for students and confused sponsoring organizations."

"I agree," you said. "When I interned at KBCI-TV, I had to write a learning agreement, keep a learning log, submit weekly progress reports, and complete a self-evaluation. I even think my internship coordinator met with my supervisor at KBCI once or twice. Another intern from a different department only had to write a one-page report at the end of the semester."

"My point exactly. Should both students earn the same amount of academic credit?" Georgia asked the group.

"With the number of interns I supervise each semester," Rick said, "I couldn't possibly maintain that level of contact with the interns and their supervisors."

"That's why I think we should establish some basic requirements, such as number of hours worked per credit hour, and leave the details up to the individual internship coordinators," Leandra added.

"Didn't the Office of the Registrar already establish that an intern must work 50 hours per credit hour of the internship?" Rick asked.

"I worked only 45 hours per credit—"

"See," Georgia interrupted. "That's what I see as the role of this internship handbook: to outline the basic

requirements for internships offered through the university and then to provide resources for providing high-quality internship experiences for our students."

"I think the handbook also needs to address some of the issues raised by the employers who responded to the internship survey we conducted last summer, especially those responses relating to how we could improve the college internship program," Leandra added. She pointed to a page from the survey report listing some of the employer comments (Document 7.1).

"Absolutely. The employers had some great ideas. I think faculty would be really receptive to their ideas," Georgia agreed.

"So this handbook is for faculty internship coordinators?" Rick asked.

"Yes. I also want to give this handbook to sponsoring organizations. I think it would be great if the handbook was reorganized and made available to students as well."

Georgia paused after looking at the group's concerned faces. "I know this sounds like an ambitious undertaking with only a few weeks left in the semester, but I already have an outline developed for faculty coordinators and sponsoring organizations," she explained as she distributed the outline (Document 7.2).

After a few minutes, Leandra asked Georgia, "How do you want us to help?"

"This is a very rough draft and needs lots of work. It's all subject to change. I was hoping that each of you could take a look at the outline and let me know if the organization makes sense to you and whether I should change or add topics. I'd also like your advice on how to reorganize the material for students."

Your Assignment

1. Download Document 7.2 from <bedfordstmartins.com/techcomm> and study it in Microsoft Word's outline view.

Responses to Open-Ended Question Number 3

Question number 3 asked employers, "In what ways could our college internship program be improved?" A total of 213 comments were received. Comments were placed in five categories: collaboration and communication, planning, student expectations, procedures for matching interns with sponsoring organizations, and miscellaneous comments.

Collaboration and Communication

Nearly half of the comments focused on the topic of collaboration and communication (97 of 213). Following are representative examples of comments in this category:

I'm tired of being the one who always comes to campus. I think the professors should visit the employer.

Better supervision by faculty. My intern's faculty supervisor took no interest in her and never tried to contact me.

We offer several internships a semester, and it seems like I'm always filling out something different for each intern. Get your act together and have a single set of internship requirements!

I believe it would be better if the faculty supervisor was available to help the intern if he or she had questions about how to do something.

I want to be able to contact professors if I have questions.

Let employers know what we are expected to do—paperwork, meetings, etc.

Better communication. When we have to hire an intern from among several applicants, I would like the faculty supervisor to provide some input.

The intern supervisor should work more closely with the employer and the intern.

Document 7.1 Employer Responses to Survey Question

On TechComm Web

For digital versions of case documents, click on Downloadable Case Documents on <bedfordstmartins.com/techcomm>.

- **Basic Internship Information**
  - *Getting Involved*
  - *Department Requirements for Internship Programs*
  - *Concluding Thoughts*
- **The Roles of the Faculty Member and Student Intern**
  - *The Role of the Student Intern*
    - Intern Responsibilities
    - The Student Release Form
    - Activity Log
    - Guidelines for Learning Agreements
  - *The Learning Agreement*
  - *The Student Release Form*
  - *Interacting with your Student Interns*
    - Communicating with Interns
      - Phone
      - E-mail
      - Site visits
  - *Placing Students in Internships*
- **Site Visits**
- **The Learning Agreement**
- **The Role of the Agency Supervisor**
  - *Legal Issues Concerning Internships*
    - Sponsoring Organization Responsibilities
  - *Getting Involved*
  - *Interacting with Your Intern*
  - *The Learning Agreement*
- **Evaluation of Interns**
  - *Evaluation Methods*
    - Intern Self-Evaluation
    - Reflective Journals
    - Agency Supervisor's Evaluation
- **Legal Matters**
  - *The Student Release Form*
- **University Policy Statement on Academic Internships and Rationale for Policy**
- **Index**

■ **Document 7.2 Outline of Internship Handbook**

Then reorganize the outline to make it more logical based on your study of Chapter 7 and your understanding of the author's purpose and audiences. Create an outline for faculty coordinators and sponsoring organizations, then create a different outline for student interns. Keep in mind that your outlines might incorporate several different patterns of organization. If appropriate, add or delete topics.

2. Write Georgia a memo in which you explain why your approaches are the best ones to use. Attach your revised outlines.