

A Program for Improving Documentation

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The Communications Design Center of Carnegie-Mellon University undertook two projects for the Systems Division of Allen-Bradley: (1) A management study of the Allen-Bradley manual-writing process, which addressed problems with the content and presentation of information in manuals, training of technical writers, enforcement of document tracking and style guidelines, and needed critical documentation. (2) A Handbook for Manual Writers. The Center helps Allen-Bradley with quality control in the manual-writing process by assigning reviewers to sample sections of manuals in draft form, to comment on problems, and to suggest additions or revisions. Allen-Bradley manuals carry the seal of the Center to attest to the procedure established for drafting, testing, and editing those manuals (but not to the readability of any particular manual).

When the Communications Design Center of Carnegie-Mellon University agreed to develop a program to improve the manuals at the Systems Division of Allen-Bradley, those of us on the project spent considerable time trying to understand the division's documentation problems. We talked with the manager of commercial services, the department responsible for producing the manuals, and with the supervisors of the technical writers. We toured the plant and learned what products they made and how the products worked. We talked with people in engineering, marketing, and training. Finally, we read: we read advertising pieces, sales brochures, product data sheets, and manuals — many manuals.

We read the manuals with two purposes in mind: to prepare a two-day workshop for the technical writers who wrote the manuals and to plan a *Handbook for Manual Writers* that we had agreed to write. At this stage, "we" were two members of Carnegie-Mellon University's Communications Design Center who were also members of the university's Department of English. By the time we were ready to give the workshop, we had added to our team two graduate students enrolled in our program for the M. A. in Professional Writing. One of the graduate students had already completed a year in the program and had taken my course in professional and technical writing; the other had completed a semester. During the two-day workshop, the graduate students attended some sessions and spent some of the time familiarizing themselves with manual-writing problems by talking with Systems Division personnel.

A workshop for manual writers

We began the workshop with a discussion of the Shannon and Weaver “Schematic diagram of a general communication system”¹ and the Lasswell formula (who, says what, in which channel, to whom, with what effect)²; and we worked hard at the concept of audience. Then, using examples from the manuals, we addressed problems that we had found in them: the importance of tailoring the manual to the needs of the users; the importance of the introductory section of the manual and of the introduction to each section; organization; the way style and usage affect tone and comprehension, including such matters as personal pronouns, direct address, word choice, wordiness and redundancy, active and passive voice; consistency of language; sentence and paragraph structure; and layout and design. We also discussed methods by which the technical writers obtained their technical information and the manual-writing process, from assignment to final approval.

A management study

Before we could undertake writing the handbook, we were asked to do a management study of the manual-writing process. Our two graduate students spent several days at the Systems Division and then returned to write a report, the essence of which was:

I. Plain English and document design

Problems with the content and presentation of information: Unclear language, insufficient examples, lack of glossary, lack of indexes, poorly designed table of contents, incomplete information, incorrect information, and lack of user-oriented logic in the organization of manuals

II. Management

Lack of proper training: Technical training for writers, training for all staff on principles of audience analysis, and training for writers on how to apply principles of audience analysis.

Lack of enforcement of Allen-Bradley document tracking and style guidelines.

Lack of critical documentation: A text introducing the fundamentals of programmable controllers, hardware compatibility charts, pocket guides for use on the plant floor, and case studies with step-by-step descriptions of normal system configurations.

A handbook for manual writers

We planned a handbook in five sections; planning, composing, designing, testing, and style and usage.

Chapter I. Planning the manual

1. Interviewing engineers, marketing and sales personnel, training center instructors, and customers
2. Learning to use the product
3. Analyzing the manual's prospective audience
4. Constructing a performance-oriented outline
5. Editing your first draft from the user's perspective
6. Conclusion

We adopted the terms "performance-oriented" and "topic-oriented" (the latter does not appear in the foregoing outline but does in the handbook) from the U. S. Army's Guidebook for the Development of Army Training Literature.³ Here are the Army's definition of the two terms and accompanying examples:

Topic-oriented writing focuses on the generalizations and concepts which constitute a body of knowledge — it tells "about" a subject area rather than telling "what to do" or "how to do it." (p. 6)

CBR: The Local Alarm

The individual suspecting or recognizing this attack will mask first and then give the alarm. The vocal alarm for chemical agent attack will be "SPRAY" for a spray attack, and "GAS" for an attack delivered by other means. The vocal warning is intended for those individuals in the immediate vicinity of the person recognizing the attack. The vocal alarm does not take the place of the sound alarm or the visual signal to alert a unit of a chemical attack. (p. 7)

Performance-oriented writing focuses on the duties and tasks a user is expected to perform and the information he needs in order to perform these duties and tasks — it tells the user "what to do" and where possible, "how to do it." (p. 6)

CBR: The Local Alarm

How to Give the Local Alarm

In case of Chemical attack, use these steps to give the local alarm:

- a. Put your mask on first;
- b. Give a vocal alarm — If spray attack, say "SPRAY"; for all other kinds, say "GAS";
- c. Give the sound alarm, visual signal, or both, as directed in your Unit SOP;
- d. Pass the warning to the Unit Commander as directed in your Unit SOP. (p. 9)

Chapter II. Composing the draft

1. Writing introductions
 - 1.1. Writing general introductions
 - 1.1.1. Purpose
 - 1.1.2. Audience
 - 1.1.3. Definitions of major terms
 - 1.1.4. Related publications
 - 1.1.5. Optional sections in the general introduction
 - 1.2. Writing chapter introductions
2. Writing definitions
3. Writing descriptions
 - 3.1. Physical descriptions
 - 3.2. Process description for understanding
4. Writing procedures
 - 4.1. How the correct choice makes a difference
 - 4.2. Narrative format
 - 4.3. Step-by-step list
 - 4.4. Step-by-step visual aids
 - 4.5. Action-response
 - 4.5. Question list
 - 4.7. Decision tables
 - 4.8. Flowchart
 - 4.9. Narrative Flowchart
5. Writing examples
 - 5.1. Extended examples
 - 5.2. Short examples
6. Conclusion

Chapter III. Designing the layout and graphics

1. Allen-Bradley Design Standards
2. Headings
3. Layout and use of white space
4. Graphics
 - 4.1. Labels
 - 4.2. Illustrations
 - 4.3. Diagrams
 - 4.4. Tables
 - 4.5. Typographic highlights

We need not discuss Chapter IV, "Testing by user edits," because Barry Jereb has covered it in his section "Document testing." In Chapter V we dealt with the kinds of matters we considered in the workshop, discussed early in this paper, and in the vendor guidelines, a discussion of which follows.

Style guidelines for vendors

As Jereb has already explained, vendors and consultants produce documentation for the Systems Division which frequently must be integrated with the division's documentation. Even if it used separately, Allen-Bradley wants to be sure that it is comprehensible. We produced, therefore, "Writing Style Guidelines for Vendors," the introduction and outline for which follows:

Allen-Bradley's technical writers design and write performance-oriented manuals to serve their users' needs. They write manuals with the user in mind to show them how to work with the product, not merely how the product works. Basically, Allen-Bradley writers compose performance oriented manuals by: helping the users picture themselves in the text, choosing words that the users can understand, writing clear, straightforward sentences, and organizing the text for the user.

Following is a list of twelve guidelines with examples. We suggest that you follow these guidelines to write your documents for our users.

Helping users picture themselves in the text

1. Address the reader directly, by name, or by using a pronoun.
2. Write in the active voice.
3. Use action verbs rather than nouns made out of verbs when you can.

Choosing words that the users can understand

4. Choose your words with care. Avoid jargon. Define or explain technical terms that you cannot change.
5. Don't rename for the sake of variety.
6. Don't use extra words.

Writing clear, easy-to-follow sentences

7. Put the parts of each sentence into logical order.
8. Untangle convoluted sentences.
9. Use lists when you have several items to discuss. Check that all items in the list have similar grammatical constructions.
10. Rewrite multiple negatives as positive sentences when you can.
11. Avoid noun strings.

Organizing the text for the user

12. Think of your user when organizing text.

Accompanying the first eleven guidelines are examples: first, poorly worded originals, and then suggested revisions. The last guideline reads:

Think of your users when organizing text. Understand the needs of your users so you can position the users correctly in the text; describe how they use the product, not merely how the product works. Lay out and design information so users can read and use it easily. Provide meaningful headings so users can find information easily. Summarize information when appropriate so users can review important information.

And the guidelines conclude:

Writing for users isn't easy. You need to think about what the users want to know and what they must know to do their job well. Think of what job the users will do, not what the product will do. This will help you gain a performance-orientation to writing. By following these guidelines, you will begin to compose manuals for the users. For more suggestions on how to write performance-oriented manuals directed to your users needs, ask to see Allen-Bradley's Publication Style Guide.

The technical writing supervisors are currently putting the finishing touches on the handbook to make sure it speaks to all the needs of the manual writers. When they have finished, Allen-Bradley will print the handbook and the supervisors will distribute it to their technical writers, run a workshop to instruct the writers in how to use it, and monitor the writing to be sure that the writers do use it.

Quality control

To assist the Systems Division with quality control in the preparation of manuals, the Carnegie-Mellon Communications Design Center has been included in the manual-writing "loop." Graduate students sample sections of the drafts of new manuals and comment on any problems they find or suggest additions or revisions. The following form, which a graduate student fills out and attaches to each draft after sampling that draft, shows the kinds of things a reviewer looks for:

CDC form for evaluation of technical manuals

<i>Area reviewed</i>	<i>Revision required</i>		
	<i>Much</i>	<i>Some</i>	<i>None</i>
Definition of audience			
For manual	_____	_____	_____
For chapter	_____	_____	_____
Content			
Table of contents	_____	_____	_____
Definition of caution, warnings, notes	_____	_____	_____
Glossary	_____	_____	_____
Index	_____	_____	_____
Completeness	_____	_____	_____
Accuracy	_____	_____	_____

Organization			
Usage and style			
Passive voice	_____	_____	_____
Wordiness	_____	_____	_____
Undefined terms	_____	_____	_____
Noun strings	_____	_____	_____
Parallelism	_____	_____	_____
Consistency	_____	_____	_____
Jargon	_____	_____	_____
Punctuation	_____	_____	_____
Layout and graphics			
Graphics with text	_____	_____	_____
Graphic labels	_____	_____	_____
Graphic labels	_____	_____	_____
Usefulness of graphics	_____	_____	_____
Production	_____	_____	_____

The Seal of the Communications Design Center

To testify to the procedure, each new manual produced by Allen-Bradley's Systems Division will carry the seal of the Communications Design Center and the following statement:

This seal means better documentation for you because this document has been written and tested according to guidelines developed by the Communications Design Center (CDC) of Carnegie-Mellon University (CMU) specifically for Allen-Bradley.

The CDC periodically evaluates A-B's application of these guidelines; however, Allen-Bradley warrants that neither the CDC nor CMU nor any unit of the university in any way certifies the technical accuracy of the document. The CDC seal indicates solely that the CDC has approved the planning and testing of the organization, layout, and writing style of manuals and is evidence of Allen-Bradley's interest in serving its customers better through easy-to-understand documentation.

The seal thus attests to the procedure and not to the readability of any particular manual.

1. Claude E. Shannon and Warren Weaver, *The Mathematical Theory of Communication* (Urbana: University of Illinois Press, 1949), p. 5.

2. Harold D. Lasswell, "The Structure and Function of Communication in Society," in *The Communication of Ideas*, ed. Lyman Bryson (New York: Harper, 1948), p. 3.

3. Richard P. Kern, Thomas G. Sticht, Diana Welty, and Robert M. Hauke, *Guidebook for the Development of Army Training Literature* (Springfield, Va.: National Technical Information Service, U. S. Department of Commerce, 1975)