

Plain English on the Plant Floor

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Product documentation such as user's guides and programming manuals are key components of the products they support. In 1982 the Allen-Bradley Company, Industrial Computer Group, recognized the need to redefine the way we prepared our manuals – for several reasons: to reduce complaints, to make our products safer and easier to use, and to increase sales. This case study shows how we identified problems with our manual writing, scheduling, and graphics. It shows how we solved these problems by using plain English and clear document design, and identifies the benefits we've gained from our new approach.

At Allen-Bradley Company, Systems Division, we make computers for industrial applications. One way we support these computers is by writing manuals that accompany our products to customers' plants. For many industrial computer companies, writing manuals appears to be an afterthought. In the past two years, however, manuals have become a key component of the products at Allen-Bradley. This paper will show why we decided to improve our industrial computer documentation and what we did to improve it.

Background

At Allen-Bradley the technical writing department was producing a variety of documentation to support our industrial computer systems. This documentation was used by audiences ranging from computer novices such as machinists and factory electricians to computer experts such as computer programmers and software engineers. These documents included installation manuals, maintenance manuals, programming manuals, user's guides, and technical data sheets.

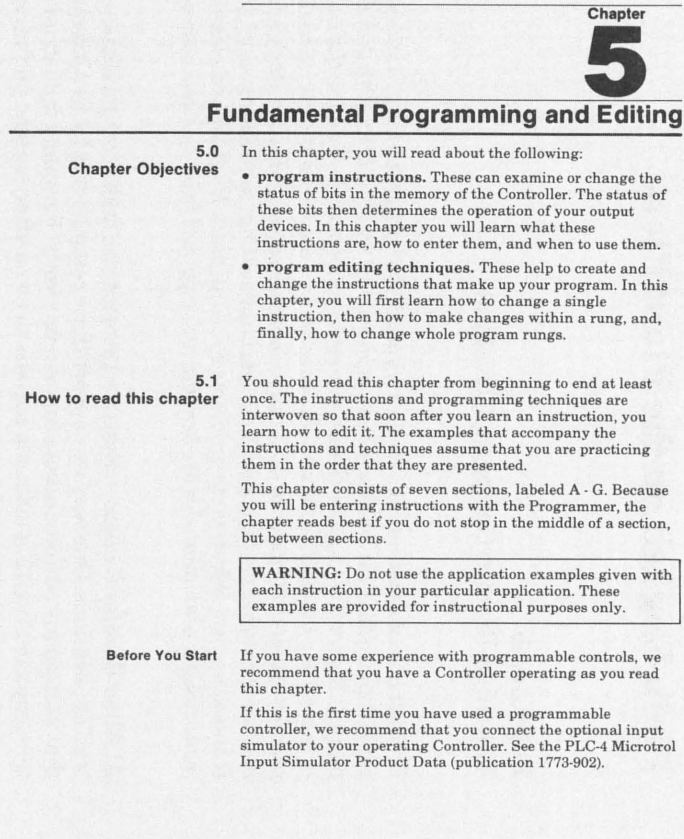
We were unaware of the impact these documents were having on our customers until the Chilton Company completed a study for us in 1982. We had commissioned this study to learn more about the marketplace for our products. To our surprise, the study indicated that product documentation such as user's guides and reference manuals was the *second* most important factor in influencing customers to buy an industrial computer. It was outranked only by quality of product. Other factors, in order, included after-sales service, on-time delivery, knowledgeable salespeople, application assistance, and price.

The results of the study clearly indicated that improved documentation would give us a competitive edge. This discovery led naturally to our taking a closer look at our documentation to see if there were any other indications that our documents needed a change. We found several:

Figure 1. Allen-Bradley Company's old layout for manuals.



Figure 2. Allen-Bradley Company's new layout for manuals.



Customer complaints. We had received letters from some customers expressing their dissatisfaction with our documentation.

Legal problems. Because our computers control heavy equipment, an unclear manual could lead to misapplication of a product and could result in equipment damage, injuries to workers, and lawsuits. In addition, an unclear manual could keep customers from getting the system running and thus result in expensive production downtime.

Phone calls. We were forced to create a toll-free telephone center to answer questions about products, many of which should have been answered by our documentation. Staffing a phone center eight hours a day requires time, talent, and money.

Feedback from field. Our salesmen and distributors began to demand better manuals. They wanted to learn about new products so that they could sell them faster. Having good documentation is especially important for international companies like Allen-Bradley; sometimes it is the only information source our international sales groups have.

On the basis of these factors we concluded that our own employees — and even worse, our customers — were dissatisfied with the quality of some of our documentation. Moreover, the Chilton study showed us that our documentation had been hurting us in the marketplace.

Defining areas for improvement

To attack documentation drawbacks, we identified three general areas of our documentation that we had to improve: graphic design, document scheduling, and writing style.

Graphic design

The most evident problems in our documents were graphic. Largely because of a lack of communication between the company's technical writing groups, Allen-Bradley was using three different layouts for technical documentation. As a result, we weren't presenting a consistent corporate identity to our customers. And our page layouts were uninviting and difficult to read (Figure 1). Although this page is similar to layouts used throughout the industrial control industry, we believed that we could do much better.

In developing a new layout we had to remember two things: the constraints on our graphic arts department and our printing budget. We knew the new layout could not be artwork intensive; it had to be easy for our designers to learn and execute. Our printing budget limited our use of color and special paper.

Once we had developed several alternative formats, we took copies to the Customer Training Center and asked our customers to complete questionnaires about the format they preferred. We evaluated the comments and picked a format we thought would be a good starting point in improving our documentation. The new layout (Figure 2) proved to be much more inviting and easy to read than the old. Consider this comparison:

Old

Two columns of justified text set in 9-point Univers. The small justified text was hard for some below-average readers to read, hard for our layout artists to correct, and hard for workers to read in a dimly lit factory.

The ½ inch page margins severely decreased the amount of white space on the page, making it uninviting and more difficult to read.

All headings were set in 9-point bold Univers. This gave all headings equal emphasis, thus making them all seem equally important. Located within the text columns, the heads were difficult to locate.

No color.

Figures were often located several pages away from the text referring to them. Searching for figures after reading a figure reference was distracting and time-consuming.

We thought the more readable format provided an excellent starting point for our new approach, and the design was one that we could continually improve.

Document Scheduling

We were badly understaffed. Frequently, for example, we had to complete documentation projects in half the time normally allotted. Our writers had difficulty writing good documents under such severe time constraints. To help solve this problem we educated our marketing and engineering departments about the following: the value of giving us advanced notification on documentation needs so that we could become involved earlier in product development, the value of hiring additional technical writers to support our products, and the costs of not allowing enough time for documentation to be done properly (i.e., phone calls, complaints, accidents). By winning their cooperation, we have increased our writing staff and schedule projects more realistically.

New

One column of text, ragged right margin set in 11-point Schoolbook. These changes made the text easier for the reader and easier for our graphics department to work with.

A 2½ inch left margin and limited line length to a maximum of 60 characters added helpful white space.

Major headings were set in 13-point bold Megaron and minor headings in 11-point bold Megaron, thus providing two levels of emphasis. Heads in the left margin make them easier to locate.

Chapter and section titles printed in blue. Coloring also made headings easier to spot.

Figures are dropped into the text where the references appear. This technique is especially important when showing someone what to enter into a computer and the display that should result.

Writing

Our writers had excellent technical backgrounds, but they lacked formal training in technical writing and exposure to the latest techniques for developing documents. To meet this need, we did two things. First, we hired professional and technical writers who had completed writing programs. Adding these writers created a more balanced department. These new writers provided a fresh outlook on documentation while our established writers provided our new writers with technical insights.

Second, we enlisted the help of Carnegie-Mellon University's Communication Design Center, specifically Erwin Steinberg and G. H. Jones to do the following:

Develop a training program for our writers

Develop a publication style manual containing guidelines on style and design

Begin an on-going objective evaluation of our documents

Create a seal of approval that could be printed in manuals that lived up to the high standards prescribed by the style manual. The seal would indicate our interest in serving our customers better through easy-to-understand documentation.

In addition to creating the style guide, Allen-Bradley and Carnegie-Mellon developed a document called "Writing Guidelines for Vendors" (Figure 3). We give these guidelines to vendors and consultants who produce documentation for us. Vendors are required to follow these instructions to have their documentation accepted. The guidelines discuss techniques such as writing in the active voice and using personal pronouns. By specifying up front the way we want the material handled, we ensure that we get a well-written document.

Document testing

We now test our documents before they reach the field. We use two types of tests: the user test and the customer test. In the user test we take manuals to the Customer Training Center and test them with representative users of our products. We have these users learn how to use a product by following the manual. We encourage them to tell us where they're having problems and what they're feeling. In this way, customers "edit" the manual. This test shows us where we've omitted information, been unclear, and misleading. In some cases we detect problems with the design of the product before it gets into the field.

In the customer tests we send our products to customers for evaluation. With these products we include a test copy of the manual and a questionnaire (Figure 4). The questionnaire asks the customers to comment on different aspects on the manual such as technical accuracy and ease of use. From the users' answers, we can determine how well the manual has supported a product that has actually been used in a factory environment.

By running these tests, we assure quality of our documents before the wider range of our customers gets them. In this way, we avoid upsetting our custom-

Figure 3. These "Writing Guidelines for Vendors" provide plain English Guidelines for consultants or vendors who produce documentation for Allen-Bradley Company.

ers with mistakes and omissions, and reduce the amount of manuals we must reprint due to errors.

Persuading management

Our managers were well aware of the problems caused by inadequate documentation, but they did not always agree with the techniques we wanted to use for improvement. For example, they thought that using personal pronouns and the active voice in technical documents was improper because it removed that objective scientific tone associated with technical documents. To convince them plain English and effective design would work, we cited document design research that supported our techniques. With scientific backgrounds, they responded to the research tradition and began to accept our changes.

Now plain English and readable formats are the corporate standard for Allen-Bradley Company. In addition to pleasing our customers, the use of plain English and clear design is providing us with the following benefits:

Our phone center used to receive more than 50 calls about our products each day. We began shipping the first simplified manuals with a product over a year ago. Since then we have received an average of only two calls a month regarding the product and the manual.

It's hard to determine the amount of sales that were influenced directly by our documentation. Our sales are increasing. Our sales force is selling more systems because it can learn about them more quickly. Distributors report that the better the documentation, the less time they have to spend in the field teaching a customer about a product.

Because we are an international company, we must translate our manuals into Japanese, German, French, and many other languages. Clearer documents that use fewer words are easier for human translators to understand and less expensive for computers to translate (computer-assisted translations cost about 20 cents a word). In addition, a document printed in a foreign language such as Arabic or German requires 125% more space, so writing in plain English saves graphics time and space.

In the past two years technical writing at Allen-Bradley has come a long way, but implementing the plain English program wasn't easy. First, we had to convince management that plain English would benefit our company. Second, we had to teach our writers how to use it. Third, we had to teach our graphic designers how to present it. Now, plain English is selling itself as a cost-effective way to communicate.

Figure 4. Customers evaluate Allen-Bradley manuals by completing this questionnaire.