Quality in Document Design: Issues and Controversies

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SUMMARY

Document designers have been asking some difficult questions about quality—particularly about how to recognize a quality document, describe its features, and measure its value. This article explores the issues and controversies related to quality in document design:

- **Trends in the quality movement**
- **Alternative definitions of quality and their influence on programs to improve the effectiveness of document design**
- **Strengths and weaknesses of two approaches to measuring the quality of documents: criterion-reference measures and prediction measures**
- **Results of a survey showing that consumers value quality in document design**
- **Examples from around the world illustrating that quality in document design can make a powerful difference**

Most practitioners in document design would argue that they have always been concerned with producing quality documents. But they would also argue that their efforts to create quality documents have sometimes been met with a less than enthusiastic response from clients and managers. From the point of view of writers and graphic designers, a disparity exists between what we believe contributes to the quality of documents and the standards against which our work is often judged.

The criteria for evaluation that are often brought to bear—speed of completion and low cost—are viewed by some in industry and government as the most important benchmarks of quality in document design. This situation has left some writers and graphic designers a bit cynical when they hear discussions of quality, especially when these discussions are mounted by those who seem to have recently "discovered" quality and whose conversion now motivates them to devise methods for designing documents more quickly and cheaply.

In an ongoing study I am conducting to explore document design practices in the United States and Japan, I find that practitioners in both countries face significant obstacles in acquiring adequate resources and enough time to produce what they view as a quality document. I suspect this may be the case in other countries as well. Figures 1 and 2 are excerpts from two interviews I conducted with writers on the job. The writer in Figure 1 works for a medium-sized writing and design firm near Washington, D.C. The

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writer in Figure 2 works for a large consumer electronics firm near Tokyo. Both writers have extensive experience and hold strong opinions about what a quality document means to them.

Throughout their interviews, both writers describe quality documents as those which meet readers' needs. In the segments shown in Figures 1 and 2, we see that both writers express a preference for producing higher-quality documents. We also find that the Japanese writer believes higher-quality documents would enhance the prestige of his company. But as Figures 1 and 2 indicate, there is a mismatch between the writers' vision of quality and their managers' view.

It may be that the current incarnation of the quality movement, with its emphasis on customer satisfaction and employee empowerment, will change the workplace for writers and graphic designers. To envision how document designers might insert themselves more strategically into

Interviewer	Do you educate your clients so they know about different options they might consider before you begin designing a new document?
Writer	Yes, I give them options and describe what a quality document is, usually explaining that they could get a document ranging from a Chevy to a Mercedes.
Interviewer	What do clients say when you compare documents to a Chevy or a Mercedes?
Writer	Most of my clients say they would like a Mercedes, but want to pay for a Chevy.
Interviewer	What about your boss?
Writer	My boss wants the Mercedes too, but I've never had the chance to make one. I've been here two years and I've only made Chevys. . . I'd say that some were not even as good as Chevys, maybe more like Pintos. I'm talking documents that are barely bare minimum.

An Excerpt from an Interview with an American Document Designer

Figure 1. Excerpts from an interview with an American document designer

Interviewer	Do you and your boss have the same definition of quality?
Writer	No, my definition of a quality document is something that my company would be proud to put its name on the cover. My boss thinks quality is speed to market and low cost.
Interviewer	Do you or your team members ever get to put your names on the documents you make?
Writer	No, never. But actually this is good. I have never been allowed to take the time to make a document I can be proud of. I'm ashamed of my work. It is not my best. I have worked here for three years and have no manuals that I would want to show in a portfolio for a new job. . . . I am not the only young person here who has this feeling.

An Excerpt from an Interview with a Japanese Document Designer

Figure 2. Excerpts from an interview with a Japanese document designer

discussions of quality, we should examine the role of quality in document design in the context of more general quality initiatives in the workplace.

This article explores the issues and controversies related to quality in document design by

- Providing an overview of the quality movement
- Discussing alternative definitions of quality
- Analyzing the dominant approaches to measuring quality
- Presenting the results of a survey showing that consumers value quality in document design
- Offering examples which indicate that quality in document design makes a difference

THE QUALITY MOVEMENT: AN OVERVIEW

The quality movement began in the 1920s and at that time was closely allied with what would become the new field of statistics. Both the quality movement and the field of statistics have their roots in practical domains such as agriculture and manufacturing and owe much to Britain's R. A. Fisher. To speed up the development of better crop-growing methods, Fisher perfected scientific shortcuts for sifting through mountains of data to spot key cause-and-effect relationships (*Business Week* 1991, p. 15). It was Fisher's pioneering work in statistics that inspired Walter A. Shewart, a physicist at AT&T Bell Laboratories who in the 1930s developed a methodology for improving worker production by measuring the extent to which items produced fell within acceptable limits of variation.

Early work in the movement—beginning with Fisher and Shewart's efforts and elaborated in the 1950s by W. Edwards Deming and others—was characterized by the development of statistical methods for measuring quality. Deming's work, as is well known, was assimilated and put into practice by Japanese business and industry. Later efforts, popularized by experts such as Joseph M. Juran and Armand Feigenbaum, shifted the emphasis from statistical control to total quality control (TQC), which later became total quality management (TQM). Total quality management refers to the application of quality principles to all company endeavors, with a special focus on internal and external customer satisfaction. For a comparison of the past and recent trends in the U.S., Japan, and Europe, see *Business Week's* "The Quality Imperative" (Oct. 25, 1991).

Since 1951 the Japanese have awarded a medal to companies that achieve the highest quality standards: the Deming Prize. The parallel honor in the U.S., the Baldrige National Quality Award, created in 1987, was named after the late Secretary of Commerce under the Reagan administration, Malcolm Baldrige. But many leaders in American business point out that the development of the Baldrige Award was too late.

Some argue that American business was lulled into complacency by the post-war boom, which allowed U.S. business unprecedented success. After the war, companies such as Xerox quickly gained 100% of their market. But according to a CNN broadcast on 30 September 1992, Xerox went from holding 100% to 10% of the market because of what critics have referred to as the epidemic of mismanagement. Companies such as Xerox have fought back and now focus extensively on customer satisfaction; but they did so only after a significant decline in their market share. Although they have made enormous improvements and have even won the coveted Baldrige, they have had to work very hard to reclaim 18% of the market they once dominated.

Many Americans believe that in the 1990s, "Made in the USA" will once again become the symbol of world-class quality (Dertouzos et al. 1989). Most American companies have had or now have some type of quality program underway. Even American colleges and universities are getting into the act. At least on the surface, in the late 1980s and early 1990s, America has rallied around the idea of quality—galvanizing leaders in business and education into thinking about how to improve their processes and products.

DEFINITIONS OF QUALITY: A CIRCLE OF AMBIGUITY

But just how to define what the media have referred to as the "Q word" has been problematic. Readers trying to figure out what is meant by quality may feel overwhelmed by the staggering number of books and articles on the topic and by the countless definitions and redefinitions, each purporting to be the last word. There is now an industry in seminar serums, training transfusions, program prescriptions, and video vaccinations—with courses, lectures, workbooks, and computer software on quality. *Business Week* reports that these corporate versions of Ann Landers made $750 million in 1990 (1991, p. 52). With so much literature devoted to the topic of quality, it is unfortunate to find that most of it fails

to make precise what is meant by quality, fails to specify explicit criteria for success, fails to develop rigorous methods for measuring success, and fails to empirically validate success or lack thereof.

In fact, some leaders in statistical quality control are calling TQM the new EST of business, where results-oriented company executives rush to the water to be born again, clutching a copy of Deming's *Out of This Crisis*—everyone holding hands in search of quality. David Banks, a statistician from Carnegie Mellon, attests that he has

> . . . heard dozens of descriptions of TQM, but none with mathematical precision. . . . Most of its features are excruciatingly obvious, and it is unclear whether TQM is intrinsically more effective than alternative management styles. Perhaps the general success of this strategy simply reflects the Hawthorne or Cooley or Heisenberg principle (the name depends on whether one is a psychologist or a physicist), and that the benefits that accrue from TQM could have been realized by hyping Theory W management, because response is not due to the kind of manipulation, but simply the fact of manipulation (Demarest 1992, pp. 4–5).

If we look to Deming, a founder of statistical approaches to quality, we find a characterization of quality based on models of optimization. For Deming, theories of statistical variation and theories of how systems work are most important. By drawing on such theories, Deming has tried to make customer satisfaction and continuous improvement a science.

In a recent interview on PBS (8 October 1992), Deming reasserted his long-standing quarrel with American management: They do not pay enough attention to the people who do their work, to the employee. Most proponents of total quality management now focus on understanding the relationships between employee education and improved productivity, between process control and employee empowerment. For example, the president of Procter & Gamble, John Pepper, told a PBS reporter on the same program—

> I would often say to my employees, don't tell me about the process, tell me about the results. But what total quality teaches you is that to really get good results, we must understand the system. Whether it's volume, profit, or the sheer efficiency of the process. We must have a thorough understanding of the systems we want to improve or change.

Others argue that the key to quality is consistency or the absence of variation. Genichi Taguchi, a Japanese engineering consultant, has specified a "quality loss function." It holds that "any deviation from dead center, no matter how small, increases a product's ultimate costs, including warranty, liability, and lost customer goodwill" (*Business Week* 1991, p. 11). Still others submit, somewhat paradoxically, that quality is speed to market, "cutting the cycle time from inception to delivery" (*Business Week* 1991, p. 11). According to IBM President Jack D. Kuehler, "next to technological leadership, shorter cycle times are what gives you the most competitive products" (*Business Week* 1991, p. 14).

Although improving an organization's ability to get its products to the market quickly can produce concrete results such as gains in market share, to win the Baldrige Award, an organization must do much more. Of the variety of quality indicators on which Baldrige contestants are judged, the most important benchmark seems to be customer satisfaction. Of the 1,000 possible points one can score to win the Baldrige, 300 are dependent on customer satisfaction (*Business Week* 1991, p. 14).

Quantifying the quality of what we do and the value added by quality in document design has become so important to our field that the Society for Technical Communication is funding a research effort to study these issues.

These diverse definitions of quality—ranging from an emphasis on employee empowerment to shorter cycle times to customer satisfaction—would lead to very different quality programs. But one theme that each shares is a focus on how systems work, at both their macro and their micro levels. If nothing else, the principles of quality management remind us that anticipating problems within a system requires an understanding of the distinctive features of that system. With knowledge of what makes a system work, organizations can both intelligently plan for quality and strategically intervene to prevent problems related to quality.

ISSUES OF QUALITY IN DOCUMENT DESIGN

Although the definitions of quality that most organizations embrace were generated for guiding

the improvement of manufacturing, these definitions have had an enormous spillover effect in recent discussions of quality in document design. To management, they have suggested criteria and agendas to which practitioners in publications departments are now held accountable. Of course, writers and graphic designers within organizations have always had to be articulate about representing their activities. But now more than ever, they are finding they must argue for the quality of the work they do, for the quality of the people who do it, and for the value they add to the organization itself.

Increasingly, members of publications departments are expected not only to speak cogently about these issues, but to present data to validate their arguments. Quantifying the quality of what we do and the value added by quality in document design has become so important to our field that the Society for Technical Communication is funding a research effort to study these issues.

To help fiscal-minded managers understand why, for example, hiring an experienced (and expensive) document designer is a wiser business decision than hiring the most inexpensive person they can find requires that document designers quantify the value of expert writing and talented graphic design. To do so, empirical studies need to be conducted to answer questions such as these:

- What perspective does an expert document designer bring to problems that other specialists (e.g., engineers, salespeople, marketing experts) may not?
- In practical situations, how much better are the documents produced by expert document designers than those produced by novices?
- Overall, how cost effective are expert document designers?
- What should managers look for to identify first-rate document design talent?

In addition to investigating the nature of expertise in document design, the field needs more research on what makes a quality document; for example, Kimble (1992) argues that such information is critical from the legal community's perspective. For decades questions related to text quality have been explored by rhetoricians, reading researchers, cognitive psychologists, and linguists. Some of this work led to the development of readability formulas for measuring the difficulty of text. Some of it led to theoretical descriptions of the text features that may correlate with text quality. Other parts of it led to methods for direct assessment of quality, such as usability testing. More recently, technical communicators have been trying to devise approaches for quantifying the quality of documents by taking advantage of what we have learned from research on readability and usability.

Approaches to Measuring Quality in Document Design

Research aimed at measuring quality in document design can be classified by the approach taken. There are currently two dominant approaches: direct, or "criterion-reference," measures and indirect, or "prediction," measures. These approaches to quantifying the effectiveness of writing and design employ different methods and serve different purposes.

Criterion-reference Measures

In using criterion-reference measures, one employs methods for directly assessing texts by having members of the intended audience for a document read, use, or rate it—judging that activity against a criterion. Presumably, when organizations design functional documents such as instruction guides, they have some criteria in mind about how their documents will be used and about what readers' interactions with their documents might look like. Similarly, some organizations establish target criteria for readers' subjective feelings and attitudes about their communications. Organizations are becoming increasingly concerned about readers' understanding of their communications, about whether readers like or dislike their communications, and about whether understanding and attitudes change over time. More organizations worldwide are attempting to quantify both the cognitive and the affective dimensions of their communications.

Organizations want to measure how total customer satisfaction is affected by readers' performance with and preference for their communications (e.g., hardcopy documents, online information, videos, and user interfaces). To factor communications into an organization's equation for quality requires establishing a numerical standard, a criterion reference, for readers' thinking or feeling about documents. For a discussion of criterion measures, see Lauer and Asher (1988, pp. 111–113) or Suen (1990, pp. 157–172).

A large number of methods to obtain measures of performance or preference are now available (for a discussion of alternatives, see Schriver 1989). These include concurrent methods, that is, those which are designed to collect data about how people think, feel, or respond as they are actually engaged in reading or using a document (e.g., protocol-aided revision) and retrospective measures, that is, those methods in which readers reflect on their experience of reading or using a text (e.g., surveys or focus groups).

The practical goal of the quality metrics developed so far is to predict the effectiveness of documents without the need to use costly criterion-reference measures for each document. Quality metrics are intended to supplement rather than replace usability testing.

In using these methods, organizations set goals for optimal performance or preference in terms of a criterion (e.g., task-oriented documents must achieve 90% accuracy, or persuasive documents must obtain an overall rating of 4 on a 5-point scale where 5 is very effective and 1 is very ineffective). Under ideal circumstances, organizations revise a given document until it meets the desired criterion level. Most organizations agree that revising to meet their criterion is essential for their important and high-profile documents, but not as important for some lesser-priority documents.

The criterion approach to quantifying the quality of documents gives organizations a very clear goal to achieve and a battery of methods for achieving it. For example, the methods that organizations now employ in their usability testing laboratories are proving to be reliable, valid, and easy to use. The drawback of performance and preference testing is that it tends to be somewhat expensive and time consuming.

Document designers in the field, however, recognize that the benefits of testing outweigh its drawbacks. The main reason: They obtain extremely valuable data for guiding revision. Research shows that the specificity of the information derived from direct reader feedback is more useful in anticipating audiences' needs than the generalities more traditional methods provide. And what writers learn from experience in usability testing can help them revise texts that have not been tested (Schriver 1992). Consequently, researchers are exploring new methods that are modeled on the diagnostic information that testing offers (e.g., Lentz and Pander Maat 1992). Moreover, organizations taking the criterion approach feel confident about the reliability and validity of the data they collect. They know that the resulting data mirrors how people actually respond to their documents.

Prediction Measures

In contrast to criterion-reference measures, prediction measures involve creating a mathematical instrument designed to predict how people might read or perform if they used a document. Prediction measures draw on a document's text features to predict a reader's ability to comprehend or use it. Two types of prediction measures are now available: on the one hand, readability formulas, and on the other, what have been called "quality metrics." For some time now, the document design community has been dissatisfied with traditional readability formulas. Recently, researchers have been developing quality metrics as alternatives. I will discuss both briefly.

Readability Formulas. The most familiar examples of prediction measures are such readability formulas as those of Flesch, Kincaid, and Gunning. As is well known, they draw on a few easy-to-count features. For example, the Flesch formula below (Klare 1984, p. 693), uses two text features, the average number of words per sentence and the average syllables per word, to predict the grade level (GL) of the text:

$$GL = 0.39\ (\text{words/sentence}) + 11.8\ (\text{syllables/word}) - 15.59$$

The numbers in the formula are called "weights" and are adjusted so that school textbooks used, say, in grade five will yield a grade-level score of 5 with the Flesch formula.

The history of readability formulas illustrates that, although there are some limited applications for them, users should exercise caution in interpreting their results because the ability of these formulas to predict comprehension accurately has been critiqued severely (see Duffy 1985; Redish and Seltzer 1985). From the perspective of the research community, almost no one would argue in support of the use of readability formulas anymore.

There were two underlying problems in the development of readability formulas:

- First, the text features used were too simple—word and syllable counts were easy to calculate, but they left out too much that was important for readability.
- Second, since the criterion was not very sensitive to what makes a text comprehensible or usable, "writing to the readability formula" did not necessarily improve a document's usability or persuasiveness; using shorter sentences with shorter words did not lead to better text.

But that is old news. In the past two years, technical communicators have been attempting to move beyond readability formulas by developing new equations they refer to as quality metrics (Redish et al. 1992; Hosier et al. 1992). These new metrics are intended to help organizations predict the comprehensibility and usability of documents.

Developing Metrics for Measuring Quality. Although the procedures for developing quality metrics have not been well specified in print (perhaps because of confidentiality agreements with the corporate funders of these metrics), we can infer that a researcher developing a quality metric carries out a four-phase plan:

Phase 1 Researchers initially represent the characteristic they aim to predict such as comprehensibility or usability by gathering empirical evidence about how a population reads and uses a type of functional document (e.g., a tax form). Developers often take the following strategies:

- Identifying a set of text features that appear in the research literature as contributing to the quality of text, such as advance organizers (see Hosier et al. 1992).
- Determining what features experts look for when they evaluate the adequacy of a text, for example, the text features experts assess in answering the question "Can users find information quickly?" (see Redish et al. 1992).

With this data, either from conducting a literature review or from convening an expert panel, the researchers establish a preliminary set of text features as possible "candidates" for the prediction measure.

Phase 2 Using the candidate text features, developers modify a set of representative documents (of the type they aim to generalize to) and then conduct usability tests with appropriate readers to determine whether the text features they have chosen improve understanding, attitudes, and ease of use.

Phase 3 Using the results of the testing, developers trim and group their list of text features to identify the set that will be included in the final formula for the prediction measure.

Phase 4 Researchers conduct a regression analysis to determine what weights the text features should have when they are combined in the final formula (for a discussion of weighting procedures, see Hayes 1989, pp. 218–223). The regression analysis adjusts the weights so that the formula predicts the criterion, that is, comprehensibility or usability.

The practical goal of the quality metrics developed so far is to predict the effectiveness of documents without the need to use costly criterion-reference measures for each document. Quality metrics are intended to supplement rather than replace usability testing (Redish et al. 1992). Developers of metrics promise no absolute criteria for analyzing quality, but they do assert that metrics are objective diagnostic tools for identifying which documents are "best of class" or which ones improve significantly over time.

Advantages of Quality Metrics Over Readability Formulas. Recent efforts to create prediction measures clearly employ a better choice of text features than those used in readability formulas. The quality metrics developed by technical communicators take into account a broader range of text features, many of which must be assessed through human judgment rather than through simple counts. For instance, instead of assessing quality by calculating the mere presence or absence of a machine-readable text feature (e.g., the presence

of multisyllable words), recent quality metrics require human raters to assess how well the feature is designed (e.g., whether the vocabulary will impede understanding for the intended audience).

In addition, unlike readability formulas that take into consideration only a very narrow range of verbal features, quality metrics have the advantage of including a wider range of "beyond the sentence" verbal features as well as some visual features. And unlike readability formulas that give the user a single number from which to draw inferences about how good a text is, quality metrics provide information about the strengths and weaknesses of a document. They do so by giving a profile of different dimensions of the text, such as whether the layout helps readers find information quickly (Redish et al. 1992) or whether the text has a high number of noun strings (Hosier et al. 1992).

Potential Threats to the Adequacy of Quality Metrics. Nevertheless, the serious problems encountered with readability formulas should make us alert to similar possible problems with these newly developed quality metrics. Underlying the process of developing these quality metrics are thorny problems related to (1) the choice of documents on which to build a model of comprehensibility or usability and (2) the choice of participants in the usability phase of the design on which to build a model of readers' performance.

Choices made about what types of documents to use—especially the range and design of their visual or verbal text features—influence significantly what types of texts the formula will be applicable to. Correspondingly, the unique characteristics of the participants (e.g., background, experience, education, or motivation) influence what audience(s) the metric best models. A potential threat to the adequacy of these new prediction measures lies in their generalizability.

An ideal requirement for a quality metric is that it could be used for certain classes of functional documents, such as "reading to do" or "reading to learn" texts. Meeting this ideal would mean that the prediction measure should include the most influential text features but no extraneous features. As described above, the regression analysis conducted in the final phase of building the formula is based on the text features of the documents in earlier phases. Thus, if documents are not chosen with extreme care, the final formula may omit features that are important to other texts or include features that are not typical of other texts.

Similarly, if the choice of participants in phase 2, the usability phase of the development, is a narrow sample of the potential audience for a class of documents (e.g., if participants are C programmers), their behaviors may not generalize well to secretaries or other populations. Consequently, the resultant prediction measure may be valid for the set of texts and the audiences for which it was built, but it may not generalize to other texts and other audiences.

Before an organization subscribes to using a quality metric, it would be wise to determine (1) whether the quality metric correlates highly with the results of criterion-reference measures for a representative sample of the organization's documents (i.e., that the quality metric is valid) and (2) whether members of the organization judging the same set of documents can agree in assigning scores to the documents using the quality metric (i.e., that they can use the metric reliably).

At this point, there is little published information on quality metrics. When articles do become available, readers will be interested in the details regarding how the metrics were developed and in issues of generalizability. With this information, document designers will be better able to evaluate how appropriate a given quality metric is for a particular context.

Developers of quality metrics have been appropriately cautious about the claims they make for their prediction measures, recommending that document designers employ criterion-reference measures in conjunction with the use of quality metrics. The metrics that have been developed so far represent a first and positive step toward providing document designers with more sophisticated prediction tools for evaluating document quality, tools with the potential to provide useful information at a relatively low cost.

A SURVEY OF CONSUMERS' PERCEPTIONS OF THE VALUE OF QUALITY

Underlying the use of either criterion-reference measures or prediction measures is an assumption that testing documents is valuable because audiences really care about the quality of what they read. It is widely held that readers' attitudes toward documents (and other communicative dimensions of products such as interfaces) influence how they view an organization's products, its customer service, and even the company itself. See, for example, *How Plain English Works for Business: Twelve Case Studies*, a

publication organized by Lee L. Gray, the former director of the Office of Consumer Affairs, and Malcolm Baldrige, the former director of the U.S. Department of Commerce (U.S. Department of Commerce 1984).

Document designers have been arguing that communications should be viewed as an important factor in any measure of customer satisfaction. (For some examples, see the annotated bibliography of articles on quality in document design that follows this article.) Unfortunately, although document designers feel strongly that quality in writing and design must be related to customer satisfaction, it has been difficult to support this conviction. My colleagues and I designed a survey to provide some data related to this issue.

Purpose

As part of a large study of how people use and understand home electronics (in particular, VCRs, telephone answering machines, cordless phones, and stereo systems), my colleagues and I surveyed consumers to get a sense of how people value the quality of the communications that accompany such products (Schriver et al. forthcoming). Our goal was to explore whether customer satisfaction could be influenced by document design.

Participants and Method

We recruited 200 consumers within a 50-mile radius of Pittsburgh, by approaching patrons of video rental shops, home appliance stores, electronics stores, and laundromats. The participants were 107 males and 94 females in six age groups: (1) under 20, (2) 20–29, (3) 30–39, (4) 40–49, (5) 50–59, and (6) over 60. Each group included between 30 and 39 people. Participants differed in education, from a grade school education (or less) to graduate school. They also differed in income, from less than $10,000 per year to more than $60,000 per year. Participants were paid $10 each to complete an 8-page survey that took about 20 minutes.

Materials and Results

I will discuss only one section of the survey, in which we asked consumers about whether clear communications might influence their ideas about a company and its products. The survey questions and a summary of the results (shown in percentages) are presented in Figure 3.

1. Do you believe consumers have the right to clear instruction manuals?

   yes = 86.4 maybe = 11.6 no = 2.0

2. Do you believe most companies care about your ability to understand and use the products they sell?

   definitely = 29.1 somewhat = 41.2 no = 29.6

3. Do you believe companies should advertise "user friendly" manuals if they have them?

   yes = 84.3 don't care = 14.6 no = 1.0

4. Would advertising "user friendly" manuals influence your purchasing decision?

   definitely = 34.7 some = 40.2 no = 25.1

5. Would you be willing to pay more for a product if you knew it had a clear manual?

   yes = 26.7 maybe = 36.4 no = 36.9

6. If you answered "yes" or "maybe" to question 5, how much more would you be willing to pay?

   $1.00 to $2.00 = 20.2 $3.00 to $5.00 = 41.8
   $6.00 to $7.00 = 12.7 $8.00 or more = 25.3

7. If you bought a product that had a clear manual, would you buy from the same manufacturer again (assuming the product was of high quality, competitively priced, and something you wanted)?

   yes = 79.1 maybe = 14.3
   no = 4.1 don't know = 2.6

(Note: These data are percentages based on an N of 200 except question #6 for which the N was 79. Some respondents who answered "yes" or "maybe" to question #5 did not answer question #6.)

Figure 3. Results of a survey of consumers' perceptions of the value of quality in document design

As the responses to question #1 show, consumers in this study overwhelmingly believe they have the right to clear instruction manuals. This finding suggests that American consumers expect clarity in what they read and that manufacturers at home and abroad should consider the quality of their communications as a factor customers care about.

But as the distribution of the responses to question #2 indicates, consumers' confidence in whether companies care about their ability to use the products they sell is rather dismal. Even so, respondents are interested in knowing about the quality of a company's communications, as is reflected in their answers to question #3, with a majority indicating that companies should advertise "user friendly" manuals if they have them. Responses to question #4 suggest that such advertising could influence consumers' purchasing decisions.

Surprisingly, responses to question #5 show that 63% of the respondents say "yes" or "maybe" about their willingness to pay more for a clear manual. This finding should suggest to managers of organizations that consumers clearly value quality in communications and the majority appear to be willing to pay a little extra for it. Apparently, organizations have failed to realize how strongly consumers care about communications, since so many seem unwilling to invest even a few cents extra per product to improve the quality of their writing and design. This may be a critical oversight.

As question #6 illustrates, among respondents who indicated that they might be willing to pay a little more for a clear manual, the majority did not choose the least expensive option we provided ($1.00 to $2.00). On average, respondents report that they are willing to pay an additional $4.80. For a fuller description of this survey, detailing relations between respondents' answers and their gender, age, and education, see Schriver et al. (forthcoming).

Obviously many factors go into purchasing decisions, and quality communications is just one of them. Even so, responses to question #7 provide strong evidence that people who buy products with clear communications are likely to become loyal repeat customers. We might also assume that satisfied customers will tell their friends. Taken together, these data suggest a positive connection between the quality of communications and customer satisfaction. More research is needed to determine the strength of the connection.

Ongoing Controversies About Quality

In addition to concerns about measuring quality and relating quality and customer satisfaction, a number of other questions have been engaging document designers. There is a great deal of interest in cost-benefit analyses of quality, in automating document processes, and in developing standards for cross-industry comparisons of quality. For example, researchers and practitioners want answers to the following questions:

- What is the relation between cost and quality in document design?
- If customers want smaller documents, how does one measure productivity if it takes longer to write less?
- What are sensible ways to think about automating documentation processes? Are some efforts to automate document design counterproductive to quality?
- How can an organization benchmark its document-design efforts with those of others if industry standards have not yet been defined?
- How does one develop quality standards to evaluate hybrid information structures such as hypertext documents or multimedia documents?

The literature devoted to these concerns is growing. Some of this literature is summarized in the annotated bibliography that follows this article.

Choosing a Definition of Quality

An overriding question document designers must consider is, "Whose definition of quality should guide a publications group?" When setting up a quality initiative in document design, organizations need a working definition that is sensitive to the process of creating documents that are best for readers. If quality is narrowly defined in terms of speed and timely delivery of documents, then most of the focus will probably be on acquiring state-of-the-art technology, automating processes, controlling repetitive tasks, just-in-time printing, and so on. Our definitions of quality influence what we pay attention to and what we ignore.

Considering Quality and Product Liability

Some organizations seem to have ignored the process by which a publication group produces a

quality document and have paid attention exclusively to cost issues. A growing number of product liability cases on record indicate that poor-quality documents are costing manufacturers hundreds of thousands of dollars.

Helyar (1992) points out that

> . . . since 1974, the number of product liability actions in federal courts has increased eight-fold. In many of these actions, plaintiffs claimed that inadequate directions or warnings caused their personal injury or loss. This proliferation is not due to increased mediocrity in documentation. It has been caused by the courts' growing tendency to impose liability on manufacturers who, for pennies per product, could improve directions and better warn against unexpected dangers in their wares (p. 126).

Taking their work together, Helyar (1992) and Carney (1991) report more than 50 examples of organizations that have been sued because of factors related to poor-quality documentation. The most dramatic (cited by Carney) is a settlement in 1986 in excess of $945,000 paid by John Deere & Company to a plaintiff who suffered severe and permanent injuries when a crawler loader he was operating slid on an embankment and rolled over on top of him. Deere & Company had failed to include appropriate warnings and instructions in the operator's manual.

Helyar (1992) recommends that technical communicators create a paper trail showing how they examined, tested, monitored, and corrected deficiencies in their instructions (p. 143). Companies beginning quality initiatives in document design might consider her advice as part of their mission.

Designing a Quality Program That Lasts

To design a program that has a chance of making an organization world class, it is important to gain consensus at the start of a quality initiative regarding an operating definition of quality and standards of excellence. But it is also prudent to be realistic, especially in these recessionary times where it may take longer to reach objectives.

Many companies that have started quality programs have already given up. According to *Newsweek*, two years after the McDonnell Douglas Corporation started a TQM effort, the program is in shambles, largely because the program's advocates had not anticipated the massive layoffs that poisoned labor-management relations. Florida Power & Light, the first U.S. winner of Japan's Deming Prize for quality management, has slashed its program because of worker complaints of excessive paperwork. And the Wallace Company, a Houston oil-supply company that won the Baldrige Award, found the honor no protection against bad times. It has filed for Chapter 11 bankruptcy protection (Mathews and Katel 1992).

These examples illustrate that quality efforts appear to be fragile and possibly short lived. In charting a course for a quality effort that will last, companies should establish incremental standards for both processes and products. Process standards, for example, can provide new document designers with expert advice about writing and design. They are a way of acculturating new document designers into an organization.

One should be careful, however, not to specify process standards too rigidly. As Wright (1991) points out and as Van Waes (1992) confirms, individual writers differ in their specific approaches to planning and creating functional texts. In fact, the same writer or designer often has several ways of approaching communication problems, depending on the task. Because there appear to be many processes that can lead to a quality text, organizations setting standards need to be sensitive to individual differences in the writing and design process. Indeed, constraining writers and designers too rigidly may inhibit creativity and may be counterproductive to promoting quality.

On the one hand, an organization may judge an improved process or an improved product relative to communications it has designed in the past. On the other hand, it may judge quality against processes and products that are considered the best of their type. The first set of standards can lead to improvement, but only the second set will meet the needs of an organization that intends to position itself competitively in the marketplace.

Quality in Document Design Makes a Difference

The field of document design may be years away from developing shared standards for quality. But over the past decade, we have already started to see examples of quality programs that have made a significant difference. Our field is now beginning to generate some impressive cases that suggest a positive answer to the question: Is quality in writing and design cost effective?

Figure 4 (on the following two pages) presents 16 examples of quality programs from around the

Does Quality in Document Design Pay?

The Motorola Corporate Finance department has substantially improved its operation after a quality movement. In fact, they won the Baldrige in 1988. They now close their books in four days, down from 12 in 1987. Changes such as clearer directions on forms and an easy-to-use format for computer screens have helped streamline the process—and save $20,000,000. a year.

(Source: L. Therrien, "Motorola and NEC Going for Glory," *Business Week*, Oct. 25, 1991, p. 60.)

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In Australia, by rewriting one legal document, the Victorian Government saved the equivalent of $400,000. a year in staff salaries.

(Source: R. D. Eagleson, *Writing in Plain English*, 1990, Canberra, Australia: Australian Government Publishing Service, p. 6.)

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By revising its forms, Citibank reduced the time spent training staff by 50% and improved the accuracy of the information that staff gave to customers.

(Source: *Simply Stated*, "Plain Language Pays," Feb. 1986, Washington, DC: American Institutes for Research, p. 4.)

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The Allen-Bradley Corporation, maker of programmable controllers, found that customer service calls shifted from 50 calls a day to 2 calls a month after they redesigned their documents using plain language and readable formats. The redesigned documents also saved them translation costs because clearer documents often use fewer words and are less expensive to translate with machine translation (which at the time of the study cost about 20 cents a word).

(Source: B. Jereb, "Plain English on the Plant Floor," in E. R. Steinberg (ed.), *Plain Language: Principles and Practice*, 1991, Detroit, MI: Wayne State University Press, p. 213.)

In 1984, the Department of Health and Social Security in the United Kingdom spent $50,055. to develop and test a series of new forms for legal aid. They report saving approximately $2,917,290. in staff time every year by using the plain language forms.

(Source: G. Dykstra, "Plain Language Centre for Canada," in E. R. Steinberg (ed.), *Plain Language: Principles and Practice*, 1991, Detroit, MI: Wayne State University Press, p. 47.)

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In 1981, after the the IRS had its 1040A form (and other related forms) redesigned, taxpayers found the forms easier to understand and use. Taxpayers were also more accurate with doing complex calculations like income averaging than they were before. The restructured forms enabled roughly 80% of taxpayers to use the simplest forms. However, only parts of the redesign were ever used.

(Source: R. S. Wurman, *Information Anxiety*, 1989, NY: Doubleday, pp. 289-290.)

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Since the British Government began its review of forms in 1982, it has scrapped 27,000 forms, redesigned 41,000 forms, and saved over $28,000,000.

(Source: Robert D. Eagleson, *Writing in Plain English*, 1990, Canberra, Australia: Australian Government Publishing Service, p. 6.)

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In Holland, a division of the Dutch Department of Education and Science reported that a form for applying for educational grants created so many difficulties for form-fillers, that on average each year 60,000 forms had to be returned to respondents because of incorrect or missing answers. A revision led to a decrease in errors such that only 15,000 to 20,000 forms continued to be reprocessed per year, saving enormous clerical costs, postage and handling.

(Source: M. Steehouder & C. Jansen, "Optimizing the Quality of Forms," in H. Pander Maat and M. Steehouder (eds.), *Studies of Functional Text Quality*, 1992, Amsterdam, The Netherlands: Rodopi Publishers, p. 166.)

Figure 4. Sixteen examples showing the value of quality in document design

In the United Kingdom, after the Department of Defense revised its claim form for travel allowances, they reduced the time spent completing the form by 10%, the processing time by 15%, and the error rate by 50%. The savings amount to £ 400,000 per year (approximately $607,400).

Source: R. D. Eagleson, "The Plain English Movement in Australia and the United Kingdom," in E. R. Steinberg (ed.), *Plain Language: Principles and Practice*, 1991, Detroit, MI: Wayne State University Press, p. 36.)

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After Ford Motor Company produced a Plain English version of the owner's guide for its Ford Taurus, 85% of the people tested said they preferred the Plain English version.

(Source: *Simply Stated*, "Plain English Pays," Mar. 1989, Washington, DC: American Institutes for Research, p. 1.)

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A technical publications group at AT&T reports that after implementing a quality program between 1987 to 1988 that focused on streamlining the process of technical documentation, they reduced the cost of documentation by 53%, reduced documentation production time by 59%, and increased the number of projects individual writers were able to complete by 45%.

(Source: A. W. Edwards, "A Quality System for Technical Documentation," in *Proceedings* of the 36th International Technical Communication Conference, 1989, Washington, DC: STC, pp. MG-45—MG-46.)

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In England, the Department of Customs and Excise cut a 55% error rate to 3% by revising some of its lost-baggage forms used by airline passengers.

(Source: *Simply Stated*, "Plain English Pays," Feb. 1986, Washington, DC: American Institutes for Research, pp. 1, 4.)

The Federal Communications Commission rewrote its regulations for citizen band radios and was able to reassign five employees who had done nothing but answer questions.

(Source: *Simply Stated*, "Plain Language Pays," Feb. 1986, Washington, DC: American Institutes for Research, p. 4.)

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Between 1980 and 1983, the U.S. government reduced paperwork government-wide by 32%, far surpassing its 25% goal. This means that by changing filing requirements and eligibility rules so that more people can use shorter or fewer forms, over 400 million hours of paperwork have been eliminated since 1981.

(Source: I. A. Etzkorn, "Why Government Has Difficulty Communicating," in E. R. Steinberg (ed.), *Plain Language: Principles and Practice*, 1991, Detroit, MI: Wayne State University Press, p. 224.)

. . . . . .

Southern California Gas Company simplified its billing statement and is saving an estimated $252,000. a year from reduced customer inquiries.

(Source: *Simply Stated*, "Gas Utilities Switch to Plain Language," Mar. 1986, Washington, DC: American Institutes for Research, p. 2.)

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The U.S. Department of Commerce, under the direction of the late Malcolm Baldrige, documented twelve case studies showing that when a company clarifies its visual and verbal language, it "builds business . . . streamlines procedures, eliminates unnecessary forms, and reduces customer complaints."

(Source: U.S. Department of Commerce, Office of Consumer Affairs, *How Plain English Works for Business: Twelve Case Studies*, 1984, Washington, DC: U.S. Government Printing Office, p. v.)

world, giving clear indication that quality in document design pays. Over the next decade, as more quality programs produce positive results, it will become increasingly evident that good document design is good business. Ω

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automated function, so that writing focuses on content only; electronic information is accessed differently, so the intellectual organization of the information is based on the user's needs rather than those of the writer; and multimedia is becoming an important part of the process of delivering information.
key phrases: CALS, automating processes, authoring tools

Bach, C. "Status of technical manual specifications and standards." *Technical Communication* 39, no. 3 (1992): 470–471. Presents a brief report summarizing the handbooks, guidelines, and standards documents in the defense industry, particularly those which focus on TQM and the ISO 9000 quality standards. Suggests that one way to begin a quality effort is to order the application and criteria information on the Malcolm Baldrige Award and to use the information as a starting point for self-assessment.
key phrases: statistical process control, TQM, ISO 9000

Burke, A. C. "Managing ourselves through quality teams." In *Proceedings* of the 39th International Technical Communication Conference, pp. 714–715. Arlington, VA: Society for Technical Communication, 1992. Sketches the formation of a quality team at Los Alamos National Laboratory, an effort that grew out of losing a manager after a decentralization of development groups. Advocates the importance of creating a charter (much like a business plan) that articulates the goals and assumptions of a quality team. Also stresses the importance of providing opportunities for continuing education for members of quality teams. Argues for the need to set high standards for the team and to aim for 100% customer satisfaction.
key phrases: team work, managing without managers, quality teams

Carbajal, S. S. "Customizing your tools: How to reduce your writing and production time." In *Proceedings* of the 38th International Technical Communication Conference, pp. RT127–130. Arlington, VA: Society of Technical Communication, 1991. Argues that technical communicators need to customize their tools for creating quality documents. Provides eight commonsense maxims developed at WordPerfect Corporation for customizing technology to allow writers to standardize the process and shorten the production cycle. Offers practical advice for making changes to automate typical repetitive formatting tasks.
key phrases: customizing processes, reducing writing and production time, documentation tools

Coe, M. A. "Customer satisfaction: New expectations of the technical communicator." In *Proceedings* of the 38th International Technical Communication Conference, p. ET86. Arlington, VA: Society for Technical Communication, 1991. Points to recent marketing research indicating that dissatisfied customers frequently tell others how bad a product is. Emphasizes that to create products that satisfy customers, technical communicators must be rigorous in conducting task analyses, audience analyses, and usability testing. Asserts that competitive benchmarking is a good way for companies to take advantage of the mistakes and successes of other companies.
key phrases: audience analyses, benchmarking, usability testing

Dillard, J. D. "Maximizing documentation usability and product quality through structured rapid prototyping." In *Proceedings* for the 38th International Technical Communication Conference, pp. 119–122. Arlington, VA: Society for Technical Communication, 1992. Advocates correcting prerelease defects in documentation and software by conducting testing on a small, manageable portion of the documentation during various early stages in the development cycle. Recommends that rather than testing completed products, technical communicators should test individual features or functions as they are available. Provides a walk-through of typical procedures for testing.
key phrases: rapid prototyping, usability, iterative testing

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key phrases: usability, questionnaire, metrics

Dunlap, J. "Customer satisfaction—The documentation challenge." In *Proceedings* of the 39th International Technical Communication Conference, pp. 700–703. Arlington, VA: Society for Technical Communication, 1992. Describes a project to revamp the documentation of Fisher Controls, a company that manufactures electronic control systems for companies that require continuous and batch control systems to automate production on the plant floor. After feedback from customers about the need for improved and timely documentation, Fisher Controls created an Excellence in Documentation Program, the heart of which was *Interleaf* software running on a DEC VAX station 3100 networked with 121 workstations in the U.S. and abroad. The new system allowed Fisher to release documentation 6 hours after revisions were in—a 95% time improvement and a 21% cost reduction. The system also allowed Fisher to introduce just-in-time printing. A survey conducted after the delivery of their most recent documentation showed an improvement from 27% to 85%.
key phrases: continuous improvement, automating processes

Elchinger, S. F., and C. C. Currie. "Designing a custom process for information products." In *Proceedings* of the 39th International Technical Communication

Conference, pp. 10–12. Arlington, VA: Society for Technical Communication, 1992. Argues for the utility of designing a custom process for documentation projects that are atypical. Suggests two steps to design a custom process: First, identify the parts of any normal process; then, examine the subparts and subtasks of the normal process. Recommends using the subparts and subtasks as the basis from which to pick and choose, doing only those which suit the situation. Asserts that the custom process is good for nontraditional projects (i.e., departures from typical genres produced), remote projects (situations where technical communicators do not have all of their equipment or support staff, or where coordination involves faxing and phoning instead of using a network), or projects where unusually quick turnaround is essential. Suggests the major benefits are flexibility and responsiveness to changing requirements and a documented process that can be implemented quickly.
key phrases: custom process, flexibility in design processes, task analysis, process tracking

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key phrases: customer service, total customer satisfaction

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key phrases: TQM, benchmarking, Six Sigma, quality function deployment, Baldrige award

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key phrases: benchmarking, quality metrics, categories for measuring success

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key phrases: international document design, simplified English, information design, expounders versus Minimalists

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key phrases: controlled process, approaches to evaluating quality, activity tracking

Hosier, W. J., P. M. Rubens, R. Krull, and C. Velotta. "Basing document quality standards on research." In *Proceedings* of the 39th International Technical Communication Conference, pp. 428–431. Arlington, VA: Society for Technical Communication, 1992. Sketches the results of a study that developed a quality metric based on a review of the literature. Study created a taxonomy of text features related to readability and usability on which there is empirical research; used the literature review to create checklist of features to evaluate; conducted some usability tests on a set of

documents, and then modified them, presumably using the features the literature said had the most impact; generated a measure using 18 variables associated with usability in task-oriented documents, a coders' manual for scoring each variable, and a database program for tallying the score.
key phrases: research-driven design of quality metrics, taxonomy of text features

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key phrases: plain English, cost-benefit of clear writing, history of plain language, consumer-oriented legal documents

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key phrases: standards for online information, style guides for online information

Lenk, D. S. "Quality information: Measuring your product and your process." In *Proceedings* of the 39th International Technical Communication Conference, pp. 356–359. Arlington, VA: Society for Technical Communication, 1992. Argues that documentation groups need metrics for measuring quality. Presents a metric developed at IBM based on counting the number of words in a document and dividing it by the number of errors to obtain a defect-per-word ratio (given as a percentage). Seems to have been generated using the Six Sigma levels-of-quality approach, a Japanese-designed tool (perfected in the U.S. by Motorola) developed for the statistical analysis of manufactured products in which you count the number of defects and aim for a 99% level of quality, which means no more than 3.4 defects per million manufactured parts. Equates words in texts with parts in equipment. The justification for using the word as the unit of analysis is "a word is the smallest unit of information on a page." Asserts that illustrations, diagrams, and visuals can be turned into a word count (p. 359).
key phrases: market-driven quality, TQM, word-level metrics, defect ratio

Mazzatenta, E. D. "Cultivating more quality and less quantity at the General Motors Research Laboratories." In *Proceedings* of the 38th International Technical Communication Conference, p. ET86. Arlington, VA: Society for Technical Communication, 1991. Offers a very brief description of a program at GM that used templates and writing guidelines to cut down the size of research reports and to standardize methods of presenting technical information. Program aimed at two genres—the research report and the convention-type exhibits designed for introducing managers to new ideas—and moved from presenting a full report (approximately 35 pages) to a research brief (2 pages). Asserts that publications using the new templates and writing guidelines improved readers' responses from nonspecialists.
key phrases: more quality and less quantity, research reports, research briefs

McGuire, G. "Working in 'flow': A theory of managing technical writers to peak performance." In *Proceedings* of the 38th International Technical Communication Conference, pp. MG33–36. Arlington, VA: Society for Technical Communication, 1991. Promotes the idea that to manage teams of writers effectively, it is important to structure writing tasks in ways that consider the unique characteristics of the individual writers on a team. Emphasizes the need for managers to understand (1) how writers think about the attractiveness and importance of their tasks, (2) how writers interpret the rewards they will attain if they perform at a certain level, and (3) how hard writers think they should work to be viewed as working at peak performance. Provides a few ideas from expectancy theory and from the Myers-Briggs Type Indicator literature as ways to begin thinking about these issues.
key phrases: matching ability and task, linking rewards to performance, understanding individual differences

Murphy, S. "Researching benchmarks for a corporate documentation group." In *Proceedings* of the 39th International Technical Communication Conference, pp. 723–724. Arlington, VA: Society for Technical Communication, 1992. Summarizes a case study at DEC that derived benchmarks on aspects related to the cost effectiveness of a documentation effort, including pages per day, average manual size, median time to complete a typical manual, cost per page, range of manual costs for typical manuals, and ratio of editing time to writing time (called quality assurance ratio). Argues for the utility of such an approach for estimating the time and cost involved in developing documentation, and thus for speaking with certainty regarding the cost of a typical document. Says these benchmarks do not measure an individual writer's performance or the quality of the output.

key phrases: benchmarking, quality assurance ratio, pages per day, costs of developing documentation

Sakson, D, and J. Sakson. "The dilemma of reorganization." In *Proceedings* of the 38th International Technical Communication Conference, pp. MG120–123. Arlington, VA: Society for Technical Communication, 1991. Outlines the problem technical writers face when companies reorganize. Presents a few advantages and disadvantages of a centralized structure versus a decentralized structure for documentation efforts. Argues for a way to promote stability in either centralized or decentralized work groups.
key phrases: reorganization, decentralized groups, centralized groups

Sandoval, P. "Appropriate automating: What parts of the documentation process should be automated?" In *Proceedings* of the 39th International Technical Communication Conference, p. 355. Arlington, VA: Society for Technical Communication, 1992. Offers a very brief argument regarding the tasks that should be automated for technical communicators. Asserts it is most important to automate tasks that get in the way rather than attempting to automate good thinking and writing. Says that Los Alamos National Laboratory has automated issues of format, style, syntax, and organization. Mentions the use of C programs that automate format-to-format conversions, skeletal documentation generation, macro (text) generation, and documentation updates.
key phrases: automating technical communication processes, using technology to streamline tasks, improving productivity

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key phrases: usability testing; text evaluation; text-focused, expert-judgment-focused, reader-focused approaches

Schriver, K. A. "Teaching writers to anticipate readers' needs: A classroom-evaluated pedagogy." *Written Communication* 9, no. 2 (1992): 179–208. Argues that to design quality documents, writers need to be sensitive to readers' comprehension needs. Presents an empirical study that tested the effectiveness of a new method for teaching writers to anticipate readers' needs. The method, called reader-protocol training, involves a set of lessons that ask writers to analyze the think-aloud protocol transcripts of users who took part in usability testing. Compares reader-protocol training and training based on audience analysis heuristics, peer groups, and guidelines. Shows that the reader-protocol method significantly improves writers' ability to anticipate readers' needs ($p \leq .001$) over other methods. Presents data showing that reader-protocol training improves writers' knowledge of audiences' needs for computer instructions and that writers' knowledge of audience transfers to expository science text.
key phrases: reader-protocol training, anticipating readers' needs, revision and planning strategies of technical writers, quality training

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key phrases: style, award-winning publications, counts of verbal stylistic features

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key phrases: training for quality, quality means less quantity

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communicators are asking about the quality of their technical publications. Offers a sketch of some of the principles underlying total quality efforts in industry and their relation to the seven areas in which companies are evaluated for the Malcolm Baldrige National Quality Award.
key phrases: TQM, Baldrige award, continuous improvement

Books/Collections of Articles

Business Week. "The quality imperative: What it takes to win in the global economy." Oct. 25 (1991). Includes six long articles on quality definitions, management issues, service issues, the public sector, research and development, and research and development statistics.
key phrases: American competitiveness, total quality management, statistical process control

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key phrases: statistical process control, total quality control, continuous improvement, customer satisfaction, total quality management

Dertouzos, M. L., R. K. Lester, R. M. Solow, and The MIT Commission on Industrial Productivity. *Made in America: Regaining the productive edge.* Cambridge, MA: MIT Press, 1989. Details the U.S. position in relation to other countries, stressing the variety of reasons American manufacturing has lost its competitiveness. Discusses the rise of Japanese and German competition in particular industries and the reasons for American decline, including outdated strategies, technological weakness in development and production, neglect of human resources, failures of cooperation, and government and industry working at cross-purposes.
key phrases: U.S.-Japan relations, global competitiveness, quality control, continuous improvement

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key phrases: benchmarking, continuous improvement, best-in-class, customer satisfaction

Proceedings: The First Conference on Quality in Documentation. Waterloo, Ontario: University of Waterloo, Centre for Professional Writing, 1991. Contains eight papers on topics related to quality in technical communications and document design. Authors include (in order of appearance) Patricia Wright (Applied Psychology Unit, Cambridge University); Karen A. Schriver (Carnegie Mellon University); Janice Redish (American Institutes for Research); Robert Barnett (Communication Research Institute of Australia); R. John Brockmann (University of Delaware); Davida H. Charney (Pennsylvania State University); Donald C. Freeman (University of Southern California); William Cowan (University of Waterloo).
key phrases: idea of quality, barriers to quality, impact of readers' self-evaluations, building usability, empirical bases for quality, quality as a function of historical paradigm, improving documentation with hands-on problem solving, plain English and the law, using color effectively

FYI

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Quality in Document Design: Issues and Controversies

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SUMMARY

Document designers have been asking some difficult questions about quality—particularly about how to recognize a quality document, describe its features, and measure its value. This article explores the issues and controversies related to quality in document design:

- **Trends in the quality movement**
- **Alternative definitions of quality and their influence on programs to improve the effectiveness of document design**
- **Strengths and weaknesses of two approaches to measuring the quality of documents: criterion-reference measures and prediction measures**
- **Results of a survey showing that consumers value quality in document design**
- **Examples from around the world illustrating that quality in document design can make a powerful difference**

Most practitioners in document design would argue that they have always been concerned with producing quality documents. But they would also argue that their efforts to create quality documents have sometimes been met with a less than enthusiastic response from clients and managers. From the point of view of writers and graphic designers, a disparity exists between what we believe contributes to the quality of documents and the standards against which our work is often judged.

The criteria for evaluation that are often brought to bear—speed of completion and low cost—are viewed by some in industry and government as the most important benchmarks of quality in document design. This situation has left some writers and graphic designers a bit cynical when they hear discussions of quality, especially when these discussions are mounted by those who seem to have recently "discovered" quality and whose conversion now motivates them to devise methods for designing documents more quickly and cheaply.

In an ongoing study I am conducting to explore document design practices in the United States and Japan, I find that practitioners in both countries face significant obstacles in acquiring adequate resources and enough time to produce what they view as a quality document. I suspect this may be the case in other countries as well. Figures 1 and 2 are excerpts from two interviews I conducted with writers on the job. The writer in Figure 1 works for a medium-sized writing and design firm near Washington, D.C. The

This article has been peer reviewed.

writer in Figure 2 works for a large consumer electronics firm near Tokyo. Both writers have extensive experience and hold strong opinions about what a quality document means to them.

Throughout their interviews, both writers describe quality documents as those which meet readers' needs. In the segments shown in Figures 1 and 2, we see that both writers express a preference for producing higher-quality documents. We also find that the Japanese writer believes higher-quality documents would enhance the prestige of his company. But as Figures 1 and 2 indicate, there is a mismatch between the writers' vision of quality and their managers' view.

It may be that the current incarnation of the quality movement, with its emphasis on customer satisfaction and employee empowerment, will change the workplace for writers and graphic designers. To envision how document designers might insert themselves more strategically into

Interviewer	Do you educate your clients so they know about different options they might consider before you begin designing a new document?
Writer	Yes, I give them options and describe what a quality document is, usually explaining that they could get a document ranging from a Chevy to a Mercedes.
Interviewer	What do clients say when you compare documents to a Chevy or a Mercedes?
Writer	Most of my clients say they would like a Mercedes, but want to pay for a Chevy.
Interviewer	What about your boss?
Writer	My boss wants the Mercedes too, but I've never had the chance to make one. I've been here two years and I've only made Chevys. . . I'd say that some were not even as good as Chevys, maybe more like Pintos. I'm talking documents that are barely bare minimum.

An Excerpt from an Interview with an American Document Designer

Figure 1. Excerpts from an interview with an American document designer

Interviewer	Do you and your boss have the same definition of quality?
Writer	No, my definition of a quality document is something that my company would be proud to put its name on the cover. My boss thinks quality is speed to market and low cost.
Interviewer	Do you or your team members ever get to put your names on the documents you make?
Writer	No, never. But actually this is good. I have never been allowed to take the time to make a document I can be proud of. I'm ashamed of my work. It is not my best. I have worked here for three years and have no manuals that I would want to show in a portfolio for a new job. . . . I am not the only young person here who has this feeling.

An Excerpt from an Interview with a Japanese Document Designer

Figure 2. Excerpts from an interview with a Japanese document designer

discussions of quality, we should examine the role of quality in document design in the context of more general quality initiatives in the workplace.

This article explores the issues and controversies related to quality in document design by

- Providing an overview of the quality movement
- Discussing alternative definitions of quality
- Analyzing the dominant approaches to measuring quality
- Presenting the results of a survey showing that consumers value quality in document design
- Offering examples which indicate that quality in document design makes a difference

THE QUALITY MOVEMENT: AN OVERVIEW

The quality movement began in the 1920s and at that time was closely allied with what would become the new field of statistics. Both the quality movement and the field of statistics have their roots in practical domains such as agriculture and manufacturing and owe much to Britain's R. A. Fisher. To speed up the development of better crop-growing methods, Fisher perfected scientific shortcuts for sifting through mountains of data to spot key cause-and-effect relationships (*Business Week* 1991, p. 15). It was Fisher's pioneering work in statistics that inspired Walter A. Shewart, a physicist at AT&T Bell Laboratories who in the 1930s developed a methodology for improving worker production by measuring the extent to which items produced fell within acceptable limits of variation.

Early work in the movement—beginning with Fisher and Shewart's efforts and elaborated in the 1950s by W. Edwards Deming and others—was characterized by the development of statistical methods for measuring quality. Deming's work, as is well known, was assimilated and put into practice by Japanese business and industry. Later efforts, popularized by experts such as Joseph M. Juran and Armand Feigenbaum, shifted the emphasis from statistical control to total quality control (TQC), which later became total quality management (TQM). Total quality management refers to the application of quality principles to all company endeavors, with a special focus on internal and external customer satisfaction. For a comparison of the past and recent trends in the U.S., Japan, and Europe, see *Business Week's* "The Quality Imperative" (Oct. 25, 1991).

Since 1951 the Japanese have awarded a medal to companies that achieve the highest quality standards: the Deming Prize. The parallel honor in the U.S., the Baldrige National Quality Award, created in 1987, was named after the late Secretary of Commerce under the Reagan administration, Malcolm Baldrige. But many leaders in American business point out that the development of the Baldrige Award was too late.

Some argue that American business was lulled into complacency by the post-war boom, which allowed U.S. business unprecedented success. After the war, companies such as Xerox quickly gained 100% of their market. But according to a CNN broadcast on 30 September 1992, Xerox went from holding 100% to 10% of the market because of what critics have referred to as the epidemic of mismanagement. Companies such as Xerox have fought back and now focus extensively on customer satisfaction; but they did so only after a significant decline in their market share. Although they have made enormous improvements and have even won the coveted Baldrige, they have had to work very hard to reclaim 18% of the market they once dominated.

Many Americans believe that in the 1990s, "Made in the USA" will once again become the symbol of world-class quality (Dertouzos et al. 1989). Most American companies have had or now have some type of quality program underway. Even American colleges and universities are getting into the act. At least on the surface, in the late 1980s and early 1990s, America has rallied around the idea of quality—galvanizing leaders in business and education into thinking about how to improve their processes and products.

DEFINITIONS OF QUALITY: A CIRCLE OF AMBIGUITY

But just how to define what the media have referred to as the "Q word" has been problematic. Readers trying to figure out what is meant by quality may feel overwhelmed by the staggering number of books and articles on the topic and by the countless definitions and redefinitions, each purporting to be the last word. There is now an industry in seminar serums, training transfusions, program prescriptions, and video vaccinations—with courses, lectures, workbooks, and computer software on quality. *Business Week* reports that these corporate versions of Ann Landers made $750 million in 1990 (1991, p. 52). With so much literature devoted to the topic of quality, it is unfortunate to find that most of it fails

to make precise what is meant by quality, fails to specify explicit criteria for success, fails to develop rigorous methods for measuring success, and fails to empirically validate success or lack thereof.

In fact, some leaders in statistical quality control are calling TQM the new EST of business, where results-oriented company executives rush to the water to be born again, clutching a copy of Deming's *Out of This Crisis*—everyone holding hands in search of quality. David Banks, a statistician from Carnegie Mellon, attests that he has

> . . . heard dozens of descriptions of TQM, but none with mathematical precision. . . . Most of its features are excruciatingly obvious, and it is unclear whether TQM is intrinsically more effective than alternative management styles. Perhaps the general success of this strategy simply reflects the Hawthorne or Cooley or Heisenberg principle (the name depends on whether one is a psychologist or a physicist), and that the benefits that accrue from TQM could have been realized by hyping Theory W management, because response is not due to the kind of manipulation, but simply the fact of manipulation (Demarest 1992, pp. 4–5).

If we look to Deming, a founder of statistical approaches to quality, we find a characterization of quality based on models of optimization. For Deming, theories of statistical variation and theories of how systems work are most important. By drawing on such theories, Deming has tried to make customer satisfaction and continuous improvement a science.

In a recent interview on PBS (8 October 1992), Deming reasserted his long-standing quarrel with American management: They do not pay enough attention to the people who do their work, to the employee. Most proponents of total quality management now focus on understanding the relationships between employee education and improved productivity, between process control and employee empowerment. For example, the president of Procter & Gamble, John Pepper, told a PBS reporter on the same program—

> I would often say to my employees, don't tell me about the process, tell me about the results. But what total quality teaches you is that to really get good results, we must understand the system. Whether it's volume, profit, or the sheer efficiency of the process. We must have a thorough understanding of the systems we want to improve or change.

Others argue that the key to quality is consistency or the absence of variation. Genichi Taguchi, a Japanese engineering consultant, has specified a "quality loss function." It holds that "any deviation from dead center, no matter how small, increases a product's ultimate costs, including warranty, liability, and lost customer goodwill" (*Business Week* 1991, p. 11). Still others submit, somewhat paradoxically, that quality is speed to market, "cutting the cycle time from inception to delivery" (*Business Week* 1991, p. 11). According to IBM President Jack D. Kuehler, "next to technological leadership, shorter cycle times are what gives you the most competitive products" (*Business Week* 1991, p. 14).

Although improving an organization's ability to get its products to the market quickly can produce concrete results such as gains in market share, to win the Baldrige Award, an organization must do much more. Of the variety of quality indicators on which Baldrige contestants are judged, the most important benchmark seems to be customer satisfaction. Of the 1,000 possible points one can score to win the Baldrige, 300 are dependent on customer satisfaction (*Business Week* 1991, p. 14).

Quantifying the quality of what we do and the value added by quality in document design has become so important to our field that the Society for Technical Communication is funding a research effort to study these issues.

These diverse definitions of quality—ranging from an emphasis on employee empowerment to shorter cycle times to customer satisfaction—would lead to very different quality programs. But one theme that each shares is a focus on how systems work, at both their macro and their micro levels. If nothing else, the principles of quality management remind us that anticipating problems within a system requires an understanding of the distinctive features of that system. With knowledge of what makes a system work, organizations can both intelligently plan for quality and strategically intervene to prevent problems related to quality.

ISSUES OF QUALITY IN DOCUMENT DESIGN

Although the definitions of quality that most organizations embrace were generated for guiding

the improvement of manufacturing, these definitions have had an enormous spillover effect in recent discussions of quality in document design. To management, they have suggested criteria and agendas to which practitioners in publications departments are now held accountable. Of course, writers and graphic designers within organizations have always had to be articulate about representing their activities. But now more than ever, they are finding they must argue for the quality of the work they do, for the quality of the people who do it, and for the value they add to the organization itself.

Increasingly, members of publications departments are expected not only to speak cogently about these issues, but to present data to validate their arguments. Quantifying the quality of what we do and the value added by quality in document design has become so important to our field that the Society for Technical Communication is funding a research effort to study these issues.

To help fiscal-minded managers understand why, for example, hiring an experienced (and expensive) document designer is a wiser business decision than hiring the most inexpensive person they can find requires that document designers quantify the value of expert writing and talented graphic design. To do so, empirical studies need to be conducted to answer questions such as these:

- What perspective does an expert document designer bring to problems that other specialists (e.g., engineers, salespeople, marketing experts) may not?
- In practical situations, how much better are the documents produced by expert document designers than those produced by novices?
- Overall, how cost effective are expert document designers?
- What should managers look for to identify first-rate document design talent?

In addition to investigating the nature of expertise in document design, the field needs more research on what makes a quality document; for example, Kimble (1992) argues that such information is critical from the legal community's perspective. For decades questions related to text quality have been explored by rhetoricians, reading researchers, cognitive psychologists, and linguists. Some of this work led to the development of readability formulas for measuring the difficulty of text. Some of it led to theoretical descriptions of the text features that may correlate with text quality. Other parts of it led to methods for direct assessment of quality, such as usability testing. More recently, technical communicators have been trying to devise approaches for quantifying the quality of documents by taking advantage of what we have learned from research on readability and usability.

Approaches to Measuring Quality in Document Design

Research aimed at measuring quality in document design can be classified by the approach taken. There are currently two dominant approaches: direct, or "criterion-reference," measures and indirect, or "prediction," measures. These approaches to quantifying the effectiveness of writing and design employ different methods and serve different purposes.

Criterion-reference Measures

In using criterion-reference measures, one employs methods for directly assessing texts by having members of the intended audience for a document read, use, or rate it—judging that activity against a criterion. Presumably, when organizations design functional documents such as instruction guides, they have some criteria in mind about how their documents will be used and about what readers' interactions with their documents might look like. Similarly, some organizations establish target criteria for readers' subjective feelings and attitudes about their communications. Organizations are becoming increasingly concerned about readers' understanding of their communications, about whether readers like or dislike their communications, and about whether understanding and attitudes change over time. More organizations worldwide are attempting to quantify both the cognitive and the affective dimensions of their communications.

Organizations want to measure how total customer satisfaction is affected by readers' performance with and preference for their communications (e.g., hardcopy documents, online information, videos, and user interfaces). To factor communications into an organization's equation for quality requires establishing a numerical standard, a criterion reference, for readers' thinking or feeling about documents. For a discussion of criterion measures, see Lauer and Asher (1988, pp. 111–113) or Suen (1990, pp. 157–172).