APPLIED THEORY

SUMMARY

- **Explains the concept of value added and shows how return on investment can be calculated**
- **Provides case studies and literature that suggest many different measures that technical communicators can use to show how they add value**

Adding Value as a Professional Technical Communicator

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Despite tremendous growth in our profession, some organizations still produce technical communications without professional assistance. In most organizations, technical communicators, whether employees or contractors, still struggle for recognition and appropriate funding. Too many product managers and subject-matter specialists still believe the fallacies of "anyone can write" and "documentation isn't so important anyway." In an era of increasing cost consciousness, we technical communicators are under ever greater pressure to justify our roles and our activities—to show just how we add value and how much value we add. How can we do that?

DEFINING VALUE ADDED AS RETURN ON INVESTMENT

As Judith Ramey (1991) writes, if we want to gain credibility and get the resources we need to do the job as it should be done, we must "learn to speak the managers' language." Managers are interested in the "bottom line"; in costs and benefits, in return on investment.

We add value when we contribute to improving an organization's return on its investment in what we do. Figure 1 illustrates this point as a balance with investments on one side and return on investments on the other.

In considering this balance, we can focus either on reducing the investment or on improving the return on the investment. Studies of how to improve productivity or how to reduce the cost of printing focus on reducing the investment. (See, for example, Murphy 1992a, 1992b; Barr and Rosenbaum 1990, also reprinted in this issue; Caernarven-Smith 1990.) Those studies are important. Reducing the cost of preparing technical communication without sacrificing quality is a laudable goal.

The key phrase here is "without sacrificing quality." If more pages per day or lower printing costs mean work that is less accurate or less readable, reducing the investment may mean less return on investment, not more. Therefore, to really look at how we add value, we must focus on return on investment (ROI).

Our hypothesis is that even if quality work by professionals takes more resources up front, the return on that investment more than makes up for the costs.

Taking the long-range, life-cycle perspective

Measuring value added as return on investment means taking a long-range view of the life cycle of documents. Although some return on investment comes during design and development, most comes after the document gets to the users. In counting costs and benefits, we must include not only preparation and production, but also support, maintenance, and revision.

In technical fields, particularly in the computer industry, taking a "life-cycle" perspective on costs is critical. The pre-market development costs of most computer software and hardware are much less than the post-market costs. Pressman (1992) estimates that 70% of software life-cycle costs occur in the maintenance phase. And 80% of those maintenance costs are due to unmet or unforeseen user requirements (Karat 1994).

"Getting it right" during design and development is much less expensive than dealing with the cost of learning about problems later. Pressman (1992) says the cost of change is 1.5 to 6 times greater during development than during design, and 60 to 100 times greater after product release.

Looking at costs across departments

As technical writers, we may think it is obvious that high-quality documents reduce post-market expenses. The balance of costs and benefits, however, may be obscured by

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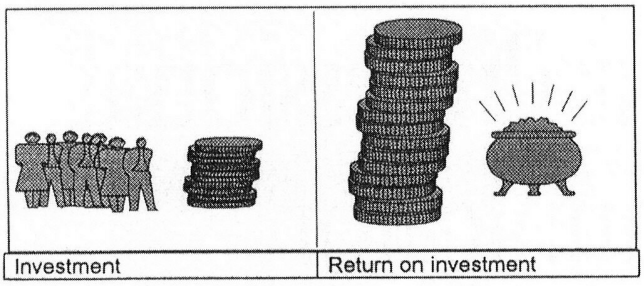

Figure 1. The goal is to have return on investment that is larger than the investment.

the way that companies handle budgets.

As Jack Selzer and I wrote some time ago in talking about usability testing,

> *The problem in most businesses and bureaucracies is that the two sets of costs (test it now or fix it later) do not come from the same budget. The manager who must get the manual to the printer on a certain schedule and within a certain cost is not responsible for whatever havoc the manual might cause later on (Redish and Selzer 1985, p. 51).*

The failure of typical corporate accounting systems to show where and how value is being added is an important issue. I return to it in the last section of this paper. At this point, let me just mention that some very-high-level managers in major technology corporations are aware of and concerned about the need to change the ways that costs and returns are measured. They are developing and using new metrics such as "time to profit," "break-even time," and "return factor" (House and Price 1991; Conklin 1995).

If your work is not being measured by these new metrics, however, and if you are having difficulty getting resources or being appreciated, then you have to find ways to show how you add value. If you suspect that poor documents are causing problems, you need to find out about those problems. How do the problems manifest themselves? How great are they? What do they cost? If you suspect that your work is greatly reducing the problems, you need to find out how much less havoc there is when you get to do the quality job you want to do.

Working with other departments

Measuring value added as return on investment also often means working with other groups within the organization. Marketing may have data on customer satisfaction. Customer Service may have data on support costs. Subject-matter specialists may be supporting users. Data on maintenance may be in another department. Going to these people to do a case study on value added may not only give you data to show your contributions, it may also help you strengthen communications and interactions among departments within the organization.

Just doing a case study may make other departments within the organization more aware of and interested in technical communicators' work. Moreover, a case study can give the organization information about its customers and its processes that is perhaps as valuable as the information about specific documents.

Measuring value added—Relevant for all of us

This discussion of value added is not only about computer documentation. Technical communicators work in a wide variety of fields and add value in all of them.

Reducing support calls, for example, is an important goal in most organizations, not only in computer companies. Reva Daniel (1995) discusses the value of having a technical communication consultant work with Veterans Benefits Counselors to revise letters to veterans. Veterans Benefits Counselors who handle inquiries answered about 1,128 calls in a year for one old letter that went to about 750 veterans. For the new letter, some Veterans Benefits Counselors didn't remember getting any calls. Overall, the same counselors answered about 192 calls in a year for the new version of the same letter that went to about 710 veterans. That's a change from 1.5 calls per letter sent to 0.27 calls per letter sent.

Measuring value added—Relevant to all our roles

Technical communicators take on many roles besides writing. We do not want studies to show only our value as writers.

Denise D. Pieratti (1995) studied how technical communicators and developers interacted in three different projects in one company. The project that was most successful involved continuous, positive interactions between technical communicators and developers. One developer told Pieratti that he was sure that he had to write less original code, had to rework less code, and constructed better code because users' tasks were clarified up front through his collaboration with the technical communicators.

Pieratti could not retroactively prove that the developer was correct in this case. As she suggests, however, on a new project you could keep track of measures like these:

- Amount of rework needed on a project in which technical communicators were involved from the beginning compared with one in which they were not
- Amount of time to fix code based on problem statements from technical communicators compared with problems described by others

TABLE 1: LISTS OF OUTCOME MEASURES TO SHOW VALUE ADDED

Measures that show increased benefits

- More sales
- Increased productivity
- More proposals won
- More awards won
- More documents (forms) returned
- More completed documents (forms) returned
- Documents (forms, letters) returned more quickly
- More people who are entitled to a benefit complete the process to get it
- More users' problems identified early in the process
- More patients take their medicine as prescribed

Measures that show reduced costs

- Fewer support calls; lower support costs
- Less need for training; lower training costs
- Fewer requests for maintenance; lower repair costs
- Less time needed for translation; lower translation costs
- Less downtime for workers
- Less effort (time, lines of code, rework) needed when technical communicators are involved early than when they are not
- Lower costs for writing, paper, printing, etc., because technical communicators convinced developers that they did not need all the documentation they were planning
- Fewer errors in specifications written by technical communicators than in specifications written by engineers
- Fewer errors by users
- Fewer errors by clerks, technicians, or subject-matter specialists who work on the documents (forms)
- Fewer forms returned to respondents because of incorrect or missing answers
- Fewer grievances
- Fewer accidents
- Less waste of materials (Carnevale and Schultz 1990)
- Less litigation; lower litigation costs (Mauro 1994; Tchobanoff 1997)

FINDING WAYS TO MEASURE VALUE ADDED

Over the course of the project, we have accumulated a substantial list of ways that you might measure value added. Let's discuss them in four categories:

1. Outcome measures
2. Ratings of customer satisfaction
3. Projections (estimates) of value added
4. General perceptions of the value of technical communicators' work

Outcome measures

To improve an organization's return on its investment, you can either increase benefits or reduce costs. Table 1 shows several outcome measures you could use to show value added.

Schriver (1993) has two pages of short examples (pp. 250–251) from several sources showing the value of making documents easy to understand and use. In Table 2, I give three more examples. I do not know who created the medical information charts in the first example. In the other two examples, technical communicators were responsible for improving products and processes. In each case, you see how one of the measures in Table 1 has been used to show added value.

Ratings of customer satisfaction

Many technical communicators and managers think of "customer satisfaction" when they think of ways to show value added. Here are some of the ways that you can measure customer satisfaction:

- Ratings of just one document or process
- Ratings of specific aspects, such as organization or layout
- Comparative ratings across documents or processes
- Preferences across documents or processes
- Ratings by users
- Ratings by "gatekeepers," such as reviewers

Measuring how happy customers or others are is relatively easy to do through customer comment cards, telephone surveys, or surveys sent by mail or through electronic networks. By asking specific questions about different aspects of the documentation or other parts of products, you can ascribe satisfaction or lack of it to the work of technical communicators. However, it is difficult to show a positive return on investment in dollar figures based solely on ratings of satisfaction. This measure needs to be correlated with other measures, such as greater sales or reduced support costs, to show its real impact.

TABLE 2: THREE SHORT CASE STUDIES SHOWING VALUE ADDED

More patients take their medicine as prescribed

Raynor, Booth, and Blenkinsopp (1993) studied the value of giving patients a reminder chart telling them what prescriptions to take and when to take them. They measured drug compliance by visiting patients' homes and counting pills remaining 10 days after the patient was discharged from the hospital. They also asked the patients to describe what pills they were supposed to take and when.

Here's what they found:

Compliance scores greater than 85%:

With chart: 86% of patients
Without chart: 63% of patients

Patients who could describe their pill regime:

With chart: 83% of patients
Without chart: 47% of patients

Both differences are highly statistically significant ($P < .001$).

Less time needed for translation; lower translation costs

Burns and Roesner (1993) show how careful planning and cooperative work between Hewlett-Packard (HP) product managers and the technical communicator/translators at Rocky Mountain Translators, Inc. meant that HP "was able to release localized versions of NewWave 67% faster than before, at half the cost and at a better quality level."

Fewer forms returned to respondents because of incorrect of missing answers

Steehouder and Jansen (1992) revised the form that Dutch parents fill out when their children are applying for an education grant. In addition to doing usability testing with two versions of the new form, they did a field trial with 300 users. Users did not know they were part of a field trial.

Based on the field trials, they projected these figures for what would happen across the nation in one year:

Forms with incomplete or missing answers:

Old version: 60,000 forms
New version: 15,000–20,000 forms

Al Blackwell of the SABRE Travel Information Network (1995) measured users' satisfaction through a response card that was included in the installation manual for a new product. On the card, Blackwell also asked users whether they were making fewer calls for help. He then verified the users' self-report against the call tracking records from the help desk. Users reported very high satisfaction with the new manual, and most reported less need for the help desk. Those who reported less need were, in fact, calling for help 80% less often than before.

Projections (estimates) of value added

In many cases, you do not want to wait until the work is completed to make the case that the technical communi-

TABLE 3: COST OF FIXING PROBLEMS AT DIFFERENT TIMES IN A PRODUCTS' LIFE CYCLE

Problem found in	Cost	Ratio
Edit cycle	$123	1.0
Beta testing	$330	2.68
The field	$3,116	25.3

cators' work is going to add value. Two ways to estimate value added are to use historical data and to conduct comparative or iterative usability tests.

Estimating avoidable costs from historical data Martha Cover and her colleagues at Cadence Design Systems, David Cooke and Matt Hunt, show us how to use estimates to make a convincing case for letting professional technical communicators do their job well (1995). They calculate the cost of developing a typical manual. They also calculate the avoidable costs that are incurred in fixing problems, including

- Costs of writing and sending updates and adding to bulletins about problems and solutions
- Costs to the technical communicators' company when a customer needs support
- Costs to the customer's company when users have difficulty getting the information that they need

Using historical information and typical salary figures, Cover, Cooke, and Hunt estimate that the cost per problem rises significantly the later it is found. Table 3 shows the relative cost of finding problems at different times.

The much higher cost of finding the problem in the field is not only the actual cost of revising incorrect information or adding missing information. It is also the cost to the customer who does not yet have the information and the cost to the technical communicators' company of supporting customers before they get the information.

The detailed descriptions and calculations in Cover, Cooke, and Hunt can serve as a "how-to" for technical communicators who want to make a similar case for the costs that they can help their companies or clients avoid.

Estimating savings through usability tests An important metric of value added is increasing users' productivity. Usability specialists and forms designers have used comparative and iterative usability testing to show how their work reduces users' errors and reduces the time it takes users to perform a task.

For example, Anita Wright of the Document Design Center at the American Institutes for Research, working with Deborah Stone and Marie van Melis-Wright of the Bureau of Labor Statistics, used iterative usability testing to show that by following a process model of document design, they could make significant improvements in Internal Revenue Service (IRS) forms and instructions (Stone, van Melis-Wright, and Wright 1993; Wright 1994).

In the section on "human factors/usability professionals" later in this article, I give more examples of how human factors specialists estimate savings and develop cost/benefit justifications.

General perceptions of the value of technical communicators' work

You can get some indications of how clients or users feel about technical communicators and what they produce by asking questions about topics like these:

- How much documentation counts in decisions to buy
- How much more customers would pay for a useful document or for a product that had a useful manual or online help
- How much clients, subject-matter specialists, or managers believe they save by having technical communicators write, edit, or review documents instead of doing it themselves (in terms of hours or money)
- How much time and effort technical specialists and managers believe they save by having technical communicators on a project team from the beginning

Karen Schriver (1993; 1997) recruited 200 consumers in the Pittsburgh area to fill out a survey on their perceptions of the value of quality in document design. She found that 63% said "yes" or "maybe" to a question about whether they would pay more for a clear manual. When asked how much more they would pay, more than 25% chose the highest option available: $8.00 or more.

The huge business in third-party instruction books also shows that users are willing to pay quite a bit extra for what they perceive to be useful information.

WORKING WITH MEASURES OF VALUE ADDED

As you consider the many measures in these lists, think about these four points:

1. Comparisons help to show value added.
2. Cost avoidance may be as important as cost savings.
3. The value increases with more users.
4. Several measures are likely to go together.

Comparisons to show value added

Showing value added is easiest when you can make a specific comparison.

Comparing two documents or two situations The clearest comparison is to have a poor document and your revision of it or a project where technical communicators were not involved and one in which they were.

I was discussing the value-added project with a technical communications manager who was very interested but was not sure how she could show value added. As we talked, she realized that her group supports two vice presidents. One believes in the value of having professional technical communicators and uses their services regularly. The other does not. By comparing support costs for similar products from the two groups, she may well find the evidence she needs to convince the skeptical vice president to use her group in the future.

Comparing users and nonusers You may have two situations to compare even when you want to measure a single document or project. If some users are working with the document and others are not, you may have a comparison. You would need to make sure that the users are similar enough that you could feel comfortable about comparing the situations. This is what Cathy Spencer and Diana Kilbourn Yates of General Electric Information Services (GEIS) did in the case study they report (1995).

In this case, one group of users chose not to use the "good" GEIS manual. They have been averaging about 128 calls for help per month. Four other groups of comparable size and level of experience chose to give their users the good GEIS manual. These users have been averaging about three calls per group per month. The group without the manual is making 1,500 more calls per year than the average of the other groups.

Comparing actual figures against estimates With sales or support costs as a relevant measure, you may be able to compare actual figures against estimates. Companies must estimate support volume for a new product to decide how many customer service people to train for that product. If the customer service group tracks calls with codes that indicate the reason for calls, you can find out how many fewer calls about documentation there were than the company had estimated.

Cost avoidance: As important as cost savings

When you count cost savings, or potential cost savings, think broadly. What would the impact be if technical communicators were not doing the job that you have shown adds value? What costs is the company avoiding by having professional technical communicators?

For example, in the GEIS study (Spencer and Yates 1995), the real value of the technical communicators is much greater than just saving the costs that GEIS is now spending to support the group that does not use their manual. What if the four other groups also did not have that good manual? They might be calling as often as the group that is already without the GEIS manual. GEIS is avoiding the cost of supporting those groups, and the cost savings increase fourfold. With every added group of users, the technical communicators' good manual helps GEIS avoid calls and adds the value of what that support would cost.

Value increases from more users

As the previous example shows, value measured as costs saved or costs avoided goes up rapidly with more users and higher volumes of use. For several years, usability specialists have been using volume estimates to show that even small improvements can mean large dollar differences (Karat 1993; Bias and Mayhew 1994).

For example:

A company gets 1,000 calls per day
for 300 days per year,
which amounts to 300,000 calls per year.
At a cost of $30 per call,
the company is paying $9,000,000 per year for support.

If the technical communicators' work reduces call volume by 10% (either the number of calls because fewer users call or the duration of calls because support staff or subject-matter specialists can find the answers more easily), the technical communicators save the company $900,000 a year.

Several measures likely to go together

If the technical communicators' work is producing benefits for the organization, it is likely to be doing so in several ways. Greater customer satisfaction, fewer support calls, lower translation costs, fewer errors that need to be fixed—all are likely to be true of the same high-quality work. Even if you don't collect data on all these measures, it is worth pointing out this truth in reporting on the measures that you do collect.

LOOKING AT LITERATURE FROM OTHER PROFESSIONS

In looking for ways to measure value added, we also turned to the literature in related professions. The most helpful information was work by related specialists: information professionals (librarians), trainers, human factors/usability professionals, and forms designers.

Information professionals

In 1986, Frank H. Spaulding, then president of the Special Libraries Association, appointed a task force to study the value that information professionals add to the organizations they serve (Matarazzo and others 1987; Beveridge 1988). The task force looked at three approaches to assessing value:

- Savings in clients' time (and the cost of that time)

Evaluating learning means finding out whether participants have knowledge and skills they did not have before. Learning is usually assessed by tests during or at the end of the training.

- Actual cost savings or financial gain that can be directly attributed to using the professionals' services
- Anecdotal evidence (testimonials) of their value

Measuring savings in client's time Helen Manning, one of the task force members, described a survey that she conducted at Texas Instruments (TI) in Houston (Manning 1987). She asked her clientele of engineers, managers, marketers, and scientists to fill out a questionnaire about using the library. One of the questions specifically asked "How many hours would you estimate the librarian saves you per month?" This question had no preset choices. Another asked "What impact do library services have on your ability to do your job?" This question offered a choice of four answers, each with a dollar figure attached.

In analyzing the results of this survey, Manning calculated the number of "engineering person-years" saved because a librarian did the work. As Manning says in her report, "Because engineers' time is at a premium, this is a number that high-level managers can appreciate." She also calculated the dollar value of those saved hours (multiplying hours saved by the hourly rate of a typical engineer). Comparing that number to the cost of operating the library showed a return on investment that was much higher than the typical return on assets for companies like TI.

Measuring dollars saved (or that could have been saved) James Tchobanoff, another member of the task force, reported cases like these (Tchobanoff 1987).

- A manufacturing company spent about $500,000 on a project. At the end, they decided to file for a patent on the product. The patent attorney suggested that their librarian do a literature search about similar products. The librarian found that the proposed product duplicated work already patented. The project had to be abandoned. If they had spent the $300 on the librarian's time and search beforehand, they could have saved the $500,000.
- A supplier discovered a problem in one of its products. Engineers didn't know what was causing the problem, but they asked the information professional to help. An $11 search of a computer database turned up an article with the answer. Engineers estimated that the $11 search saved them 200 hours of laboratory work.

Trainers

Measuring value added has also become an important concern to many people in training. In its July 1990 issue, *Training and development journal* included a 32-page supplement devoted to "Return on investment: Accounting for training" (Carnevale and Schulz 1990). The authors begin the supplement by saying that "[a]ccounting for the positive economic influence of training and development is the most critical issue in the training profession today."

Evaluation has always been important in training, but very few training groups evaluate what they do on the level of measuring return on investment. Trainers think of evaluation at four levels (Gordon 1991; Carnevale and Schulz 1990):

- Level 1: evaluating reactions
- Level 2: evaluating learning
- Level 3: evaluating behavior
- Level 4: evaluating results

Evaluating reactions means finding out whether participants liked the training. Most training courses ask for reactions at the end of the training.

Evaluating learning means finding out whether participants have knowledge and skills they did not have before. Learning is usually assessed by tests during or at the end of the training.

Evaluating behavior means finding out whether participants act differently on the job. This can be done by observations or tests conducted at some reasonable time after the training.

Evaluating results means finding out how the training affected the organization. This fourth level is comparable to the return on investment (ROI) studies that we are considering as measuring value added.

In "Measuring the 'goodness' of training," Gordon (1991) writes: "It's probably fair to say that the bulk of all employee training programs conducted in the U.S. are evaluated only at Level 1, if at all. Of the rest, the majority are measured only at Level 2." He reports one case of a Level 4 evaluation, a comparative study that Federal Express set up specifically to determine ROI:

> *Federal Express compared three groups of couriers: 20 who had recently been through the complete new-employee training program; 20 who were put on the job with only the safety part of the training program; and 20 veterans who had been trained five or more years ear-*

lier. Managers, who did not know the purpose behind the study, rated each courier daily for 90 days on 18 performance measures. The value-added study was based on the 10 measures that could be associated with a specific cost per problem.

The study revealed these annual costs of problems per courier:

Recently trained $2,492
Untrained $4,833
Veterans $4,064

Training each new courier was saving $2,341/year (subtract $2,492 from $4,833). Training costs were $1,890/courier. Training, therefore, was producing an ROI of $451/courier. If Federal Express hires 1,000 couriers in a year, this one training course has an ROI of almost half a million dollars per year. (The study also showed the need to retrain veterans. Procedures had changed since they had been trained, but some were still using old procedures.)

Many of the issues raised in articles about ROI in training are similar to issues that technical communicators face. For example, Gordon (1991) points out that few ROI studies are done because "[c]lients, meaning line managers, are generally loath to add the expense of rigorous evaluation to an expense they already regret—that of training." This is also an issue for technical communicators, but there are two ways to handle it:

- You can use data that the organization is already collecting. Value-added case studies that focus on support costs or on translation costs may require few resources. The data is probably already being collected. It just isn't being used.
- You can include the cost of evaluation as part of the investment. Iterative usability testing is a way both to find and to fix problems and a measure to show value added. The cost of the iterative testing is part of the investment. The savings from improvements are part of the return on investment.

Human factors/usability professionals

The most relevant literature from other fields comes from our closest colleagues: human factors and usability specialists.

Improving sales by focusing on usability Dennis Wixon and Sandy Jones of Digital Equipment Corporation (DEC) show how focusing on usability can increase sales far beyond expectations (Wixon and Jones 1995). For the second release of a product (DEC Rally, Version 2), usability specialists were able to apply several usability techniques throughout the development process. They worked closely with and had the strong support of developers and technical communicators.

To provide data early in the process, the usability specialists visited users and brought back videotapes to show their colleagues how the first version was being used. They set measurable usability goals, developed benchmarks working with users in their own environments, developed specific techniques for tracking problems and setting priorities among them, and integrated usability requirements into the product requirements and iterative tests with users into the project plans. The usability specialists used a variety of techniques including contextual inquiry (Holtzblatt and Jones 1993; Beabes, Raven, and Holtzblatt 1993; Wixon, Holtzblatt, and Knox 1990), prototyping, and highly focused empirical tests.

The usability specialists added significant value to the product. Revenue for the new release increased by 80%. As the authors say, you would expect an increase in revenue for the second release of a product, but these revenues are 30% to 60% over an optimistic projection of expected increases. Furthermore, in a survey that was conducted by another group at DEC—not by the usability specialists—users cited improved usability as the second most important aspect of the new version of the product.

Measuring value added through iterative usability testing Human factors specialists use iterative testing to show the added value of their work on interface design. The technique is equally appropriate for technical communicators. Table 4 shows the steps for using this measure.

In two examples reported by Karat (1993; 1992; 1990), for a specific product with a small user base, the cost of usability activities was $20,700, and the benefit was $41,700. For a product with a much larger user base, the cost of usability activities was $68,000, and the benefit in the first year alone was $6,800,000.

Savings measured through usability testing are projections. They are only estimates of what reality will be like. When the difference is a 100-fold return on investment, as in Karat's second case, however, it is obvious that even if the estimate is fairly far off base, the return is going to be substantial enough to be well worth the investment.

Cost-justifying usability by estimating savings Usability testing is only one technique that human factors specialists use for justifying usability activities by estimating future savings. Mayhew and Mantei (1994) show how to estimate savings due to increasing users' productivity, decreasing training needs, decreasing users' errors, decreasing the need for customer support, and decreasing late design changes. Each savings is based on estimating a number of factors, but if each estimate is reasonable, the resulting number should be persuasive to managers.

TABLE 4: HOW TO MEASURE VALUE ADDED THROUGH ITERATIVE USABILITY TESTING

1. Conduct a usability test, recording time for a set of tasks.
2. Change the interface (documents) on the basis of test results.
3. Conduct a second test, recording times for the same task.
4. Calculate the saving in time for each task.
5. Multiply the time saved by the number of (potential) users (and sometimes by the number of times per day or week a user is likely to do that task).
6. Convert time saved to dollars saved by multiplying with users' average salaries.
7. Compare the amount saved to the cost of doing the usability work.

For example, following the logic in Mayhew and Mantei but with different numbers, let's say that there are 500 people in the company who will each work with three primary screens on a task that they will do an average of 20 times a day. Each user works about 200 days a year at an average hourly "loaded" rate of $20/hour. If our work as technical communicators helps developers design menus, field labels, messages, or online help that means even a savings of one second each time one of these users works on each screen in this task, we would be saving the company more than $33,000 a year.

Here's the calculation:

We're fixing 3 screens
that each user uses 20 times per day
or 60 times per day per user.
If there will be 500 users,
that's 30,000 uses per day
If each worker works 200 days per year,
that's 6,000,000 uses per year
and 6,000,000 seconds saved
or 1,666.67 hours saved.
If users earn $20 per hour,
that's $33,000 per year we've saved the company.

As Mayhew and Mantei point out, some savings relate to one-time costs. Others, such as increased productivity, continue at the same rate for every year the product is in use. Thus, if this product is used this way for five years, the savings just from this one second improvement would be $166,667. By adding together estimates of several improvements on several measures, usability specialists are able to project significant return on investment (value added) for their work.

Forms designers

Forms design is a specialization within technical communications where work has been done on showing value added. Researchers at the Communication Research Institute of Australia (CRIA) pioneered some of the techniques for showing value added, particularly in projects that involve changing forms and the systems that the forms support (Fisher and Sless 1990; Barnett 1991). They use a technique similar to that of the usability specialists. That is, they begin and end with a quantitative analysis and use iterative usability testing as a diagnostic technique as they revise the documents. Table 5 shows how you might estimate value added in forms design by measuring the cost of different versions of forms.

Depending on the types of errors and the differences in time to fix different types of errors, you might want to do a more detailed analysis. By doing the same analysis on forms before and after revising them, you may be able to show significant value added.

For example, Fisher and Sless (1990) report on a project for an Australian insurance company in which they achieved a 97.2% reduction in errors, saving the company $536,023 a year in administrative staff salaries alone. As Sless (1993) reminds us, however, reporting numbers like these can mislead technical communicators into thinking that any changes to forms will achieve similar cost savings. That's not true. The process is a critical part of the story.

CAVEAT: NUMBERS ARE NOT THE WHOLE STORY

As you read case studies about value added, you must look not only at the numbers the technical communicators (or other professionals) were able to achieve, but also at the processes they used to achieve those numbers. That's why

TABLE 5: HOW YOU MIGHT ESTIMATE VALUE ADDED IN FORMS DESIGN

1. Collect a sample of forms submitted in a given time period.
2. Calculate the average number of errors per form for the sample.
3. Observe clerks getting the errors fixed. Calculate average time to fix a form.
4. Calculate the cost of fixing an average form (number of errors × time to fix errors × clerks' salary)
5. Calculate the cost to the organization over a certain time period (average cost per form × number of forms dealt with in that time).

STC insisted that we include on the questionnaire items about the processes that technical communicators are using (Ramey 1995). That's also why each of the case studies in this special section talks about process as well as results.

Reporting on the process is critical The numbers never tell the whole story. For example, in Sless's project on insurance forms, the process included investigating the system: what purposes the form fills in the organization, who uses it, how they use it, what constraints there are on changing it, and so on. It also included negotiating changes not only in the form but also in the system and the related constraints. It involved finding the right design and vocabulary for the specific users through iterative testing. Sless (1993) says that this project's success was due to "communication research, design methods, testing, project planning, and successful negotiation," not to just blindly applying guidelines.

Sometimes, in fact, the technical communicator adds value by realizing that the best solution to a communications problem is to not develop a document or to develop an entirely different type of document. Carolyn Boccella Bagin of the Document Design Center once helped an insurance company by turning a single form that covered seven different situations into a series of letters that were much easier for users to understand (Bagin 1988).

Poor processes can hinder value Redish and Dumas (1991) and Grudin (1993; 1991) explore some of the reasons why many organizations find it so difficult to deliver high-quality products (documents or software) to users. The reasons all illustrate failures in process.

You can use failures in process to show the importance of professional technical communicators. If your organization does not have processes in place that allow you to add value, you can document the cost of poor processes or of people not adhering to the processes that are meant to assure quality and usability. You can use these negative case studies to show how you could add value if the circumstances were changed.

CAVEAT: MAKE SURE YOU GET CREDIT WHEN YOU ADD VALUE

It isn't enough to do studies of value added. We have to make sure that managers and executives know about the value that we add.

A major problem in many organizations is that what managers and executives see in accounting reports does not show the value that a specific group of professionals, like technical communicators, is adding. Traditional accounting practices in many organizations make it very difficult to show the benefits of improving quality and adding value. In fact, with traditional accounting practices, actual improvements in performance may be hidden, or, even worse, show up as negative value on accounting reports (Kaplan 1990a).

As Carnevale and Schulz (1990, p. S-4) point out in discussing return on investment in training: "Managers . . . sacrifice long-term profit gains in favor [of] short-term cost cutting. Under current management accounting standards, the economic impact of such mismanagement is not assessed."

Three problems with traditional accounting practices

One problem is that many accounting systems still track costs by department, not by project. If customer support costs go down, the customer support group looks good. The documentation group doesn't get any credit for reducing support costs, even if good documentation contributed substantially to the reduction.

A second problem is that once accounting reports are set up, they may be slow to change. They may not let a department distinguish costs for different activities or for similar work on different products. The cost per unit of work may seem to go up, even when the department has become more efficient.

A third problem is that many accounting systems are still based on a manufacturing model, not a labor-intensive service model. They use measures that relate overhead and labor cost to the number of widgets that are produced or worked on. A documentation group that is measured only on pages per day will appear to be costing more if technical communicators are spending time on activities other than writing and production or if their higher quality documents have fewer pages. Value that they are adding through these other activities or the greater benefits of shorter documents may not be reflected in the accounting reports.

A case study that illustrates two of these problems

Kaplan (1990b) reports on a case study that illustrates the first two of these problems. The case study is from the quality assurance (testing) group in a company that manufactures computer parts.

The parallels should be obvious to technical communicators. The first problem may affect all technical communicators who are expanding their roles to be involved in other aspects of the process than just writing and production. The second problem may affect all technical communicators who are now working on a more diverse suite of documents than they were before.

Problem 1. No credit for helping other departments

Because of their expertise and experience, the test specialists in Kaplan's case study were able to suggest changes in the process that eliminated many sources of defects. The company reduced defects by more than two-thirds in a three-year period. With the new process, the company was able to do much more "just-in-time" manufacturing, thus keeping inventory at about 6% of the earlier rate. Scrap costs also went down significantly. However, none of those figures showed up in the accounting reports about the testing group. They got no credit for their contributions, because the benefits were outside their own group.

The testing group hired a person to act as liaison to product designers to do more to eliminate defects early. That person counted as a cost to the testing group. All the benefits of what that person did showed up elsewhere; they were not tracked back to the testing group.

Problem 2. Accounting doesn't keep up with changes

In addition to helping other groups, the testing group had improved its own procedures. It reduced throughput time from 35 days to 3. It improved on-time performance from 85% to 99%. What Accounting reported on, however, was the cost of testing each unit, and, according to the accounting reports, that had gone up. Based on these reports, the company actually took some work away from the testing group and gave it to a less-expensive vendor in Asia. How could the group that had improved so much be costing more?

The answer was that the work they were doing had changed, but the accounting reports had not. When the accounting reports were set up, the group was testing only one fairly simple device. Now they were testing a wide variety of devices, some of them quite complex.

The accounting reports didn't separate the types of work. In fact, when costs were separated by type of device tested, the in-house group was cheaper than the vendor for the work that had been sent to the vendor! Because the accounting reports allowed the group to show only the average cost across all their activities, top managers and executives were not seeing how the group had added value by making their own procedures more efficient.

Implications of accounting problems for technical communicators

Do you know what upper management sees about the costs and benefits of your work? Do you know what measures are used by Accounting to track costs for technical communications? Do those measures match the way your group now works and the diversity of work you do? Do those measures give technical communicators credit for contributions to other groups?

If what upper management sees does not give you credit for the value you are adding, toot your own horn. Make sure that your contributions get touted in company newsletters and at briefings. See about getting accounting reports and accounting practices changed to reflect more modern business practices.

CONCLUSION

Part of a manager's job is to make judgments about the value of the contributions that different people make. Without hard data, managers make those judgments subjectively. Without data, managers must draw their own conclusions, which may be incomplete or inaccurate. Even with data, if it is from traditional accounting systems, managers may be getting an incomplete or inaccurate picture. You have to consider it part of your role to show the value that you add as a technical communicator. TC

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Many people shared ideas and literature throughout this project. Denise D. Pieratti located the librarians' study of value added. Denise and Chris Velotta each found relevant articles on value added in training. The references in those articles then led to other relevant material. Thomas Lang reminded me of Lou Morris' 1979 work on the value of written information about drugs and also sent articles on more recent studies, including the Raymond, Booth, and Blenkinsopp study of the value of reminder charts. Barry Jereb, Candace Cole, and Mary Wilkin-

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POSTSCRIPT

In 1993, STC funded Judy Ramey (professor of technical communication at the University of Washington) and me to lead a one-year project on measuring the value added by professional technical communicators. We did the project by conducting a literature search to see how other professionals measure the value they add, by surveying technical communicators and managers, and by gathering case studies.

We reported the project results as a special section of *Technical communication* (February 1995). This was the lead article, serving as an overview of the project, summarizing what we learned, and offering our recommendations to technical communicators on what they could do in their own situations. The other articles in the same special section—a report of our survey results and five case studies—are also still well worth reading.

Interest in the topic has never gone away. It's still a "hot" issue. Judy Ramey and I continued to gather and present case studies, first in *Technical communication*, and then in *Intercom* through seven more case studies. (See *Technical communication*, May 1995, and various issues of *Intercom* for 1996 and 1997.)

I and others involved in this project have given talks based on this article at many chapter and regional meetings—and to other groups. Later articles, including one by Jay Mead in *Technical communication* (August 1998), and another by Saul Carliner in *Intercom* (September-October 2000), have added to the discussion of what we mean by adding value and how to do it. Eight years later, the points in this article are still valid. I hope it continues to inspire technical communicators.

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