Response to the Commentaries on *Producing Quality Technical Information*: The Common Sense of Producing Quality Technical Information

Morris Dean
Office of the President, University of North Carolina
910 Raleigh Road
Chapel Hill, North Carolina 27515-2688
mdean@northcarolina.edu

Abstract

The editor and principal writer of Producing Quality Technical Information (1983) responds to the commentaries: answering questions about the sources of PQTI; discussing what the System Information group at IBM's Santa Teresa Laboratory were doing about usability from 1979 to 1983; comparing the predecessor nine "ease-of-use factors" with the seven "qualities" of PQTI and the nine "quality characteristics" of Prentice Hall's subsequent editions of PQTI, published under the title Developing Quality Technical Information; and revealing his own motives and thought processes in working on several usability initiatives in the laboratory at that time, including the publication of PQTI.

I.7.5 Document analysis—*human factors*

Keywords*: quality, usability, ease of use, psychology, psychological basis, memory, learning, learner, task-orientation, reading, reader, persona, common sense, guidelines*

Done anything lately?

Nothing I added to the commentaries on *Producing Quality Technical Information* would be as useful as that work itself, so kindly praised by the commentators. Reading their remarks has been an unexpected gift of my participating in this "classic reprint." Upon leaving the International Business Machines Corporation at the end of 1996, I effectively left the field of technical communication altogether. I didn't bother to apply for regular fellow of the Society for Technical Communication, since I had only the year before been elected an associate fellow (having been nominated by Roger Grice, one of the commentators) and hadn't "done anything lately." The commentaries tempt me to believe that maybe sometimes it doesn't matter whether you've done anything *lately.*

Edmond Weiss comments that if the book can be faulted, "it is for failing to cite or acknowledge the several non-IBM writers (like [himself])…whose concepts and terminology are embedded in its pages." It might be useful if I cited them now. I did very little research specifically for *Producing Quality Technical Information*, hardly more than relying on previous reading:

- a few chapters in a psychology textbook that my wife had used as an undergraduate at the University of California at Berkeley (Krech and Crutchfield, 1962);

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- of a cheap paperback edition of a book about gestalt psychology (Köhler, 1929), which I was reading the day in 1966 I met Carolyn Warren and about which I spoke to her with such enthusiasm in our very first conversation that she decided to marry me (and did, six weeks later);
- of a couple of books on learning (Hergenhahn, 1976, and Hilgard and Bower, 1966);
- of the paper, "The Magical Number Seven, Plus or Minus Two: Some Limits on Our Capacity for Processing Information," and other writings by its author (Miller, 1967);
- of another book on memory (Weinland, 1957); and, preeminently,
- of *The Elements of Style* (Strunk and White, 1972), which, at the time, almost all IBM writers and editors had on their bookshelf.

Dr. Weiss's contributions to *Producing Quality Technical Information* must have come by way of osmosis, for I first heard his name several years later, in 1986, I think.

The commentators have focused mainly on what followed the publication of *Producing Quality Technical Information*. I have already begun to comment on what preceded it, and it might be of interest for me to continue along that line, for this journal's readers may wonder whence came the book that went on to the places identified by the commentators, and what thought processes created it.

Creativity

Creativity was a main interest of mine as a member of the STC, starting with my initial paper, "Invoking the Muse of Technical Writing" (Dean, 1973). Indeed, the desire to explore interesting ideas for papers to deliver at what were then called International Technical Communication Conferences inspired an almost annual flare of creative thinking, as when, in 1979 or 1980, I conceived the idea that there must be a "psychological basis" for the obvious applicability of *The Elements of Style* to computer documentation. Investigating the idea led me to read my wife's psychology textbook (and most of the other works mentioned above) and to write "Using Experimental Psychology in Technical Writing" (Dean, 1981). I subsequently found that the topics of that paper were a veritable trove to be mined for further application, most immediately to creating "meaningful computer messages," about which I wrote a paper presented to an IBM software symposium (Dean, 1981). The editor of the *IBM Systems Journal* invited me to republish that paper, which I of course gladly did, as an opportunity to consider the issues more deeply (Dean, 1982). Thus, my thinking about the psychological bases for certain ways of presenting technical information put me in a perfect mental place in which to work on *Producing Quality Technical Information*.

One of my esteemed colleagues at the time, Fred Bethke, recalled recently that *PQTI* "was a sort of culmination of a Santa Teresa Laboratory-instigated golden age of documentation theory." I quote the phrase with a smile similar to that with which Dr. Bethke wrote it, for I believe that we were more inspired amateurs than scientific "professionals." At any rate, that was how I have always regarded myself. In that light, I was fascinated by Dr. Weiss's comment on the tone of *PQTI*:

> …the original corporate publication does not even highlight the IBM authors and editors themselves. This is no doubt a deliberate policy choice. First, the lack of named authors gives the publication an institutional, rather than a personal, aura; it is a corporate work, putatively reflecting a broad consensus, rather than a set of directives and preferences by particular individuals…Second, the absence of citations and footnotes keeps the document looking non-academic; it is a business publication, meant to provide practical tools, rather than an intellectual exercise by persons with an unusually intense interest in technical language.

I believe that Dr. Weiss was working from a photocopy of the original publication, so he could not see that, in fact, a list of names, under the heading, "Prepared by," did appear discretely on the outside back of the fairly dark gray cover. I think he is right, nevertheless: the authors and editors weren't *highlighted*. But was this "a deliberate policy choice"? I think not, certainly not in the corporate business sense Dr. Weiss seems to intend. What it was was a design choice by the very able graphic designer, Lori Neumann, with whom I worked more closely than with anyone else in developing the book. Ms. Neumann strove for an elegant, understated visual effect,

I for a text as clear and limpid as the "truths" it expressed. If I had a model for the writing of *Producing Quality Technical Information*, it was the mystical, Rilkean cadences of *Tractatus Logico-Philosophicus* (Wittgenstein, 1933), which begins:

> The world is everything that is the case. The world is the totality of the facts, not of things. The world is determined by the facts, and by their being *all* the facts. For the totality of facts determines both what is the case, and also all that it is not the case.

The paragraphs of *Producing Quality Technical Information* march to such cadences. For example:

> When people first encounter a body of information, they usually want to see the whole that the parts add up to. Like travelers at the beginning of a journey, they need a map of the terrain. And, as their trip progresses, they need to keep their bearings in relation to the destination.

No academic references were needed, because the words seemed to me to speak for themselves. Perhaps we should have understood (maybe Ms. Neumann did) that we were putting on the cloak of a corporate persona, a sort of ex cathedra cachet or imprimatur. And maybe some readers have harkened to our message only because of the corporate robe they perceived it to be dressed in. But I wasn't writing for such readers.

Task-orientation

In his notes to me, Dr. Bethke recalls that we had been given some initial momentum by what he refers to wryly as the "discovery" of task-orientation. He remembers being thunderstruck to learn that it wasn't obvious to all writers that giving readers the information they needed was a good, indeed fundamental, thing. Even many of those writers who did know about "keeping the reader in mind" thought that it meant vocabulary or style or something along those lines. What seems to have happened at Santa Teresa Lab is that this most basic of ideas, *keep the reader in mind*, got the more formal and more specific name, *task-orientation*, when the idea was officially promulgated as perhaps the central concern of an STL study group convened in mid-1979 by System Information manager Flo Pessin "to find ways to improve the usability of publications supporting the Laboratory's programming products" (Bethke et al., 1981).

The report of the study group led to several significant undertakings:

- Tools began to be investigated for measuring ease of use (or some aspects of it).
- Usability evaluations became "part of the formal review of programming specifications."
- We formed the Architecture Review Board, whose purpose was to review documentation plans to try to ensure that the documentation would adequately support the apparent tasks of the intended audiences. (Since the board's interests were mainly analysis and enforcement, I served on it only reluctantly and with about as much [that is, little] enthusiasm as I had for helping my wife play policeman in raising our children.)
- We developed a set of educational modules "for those who are to produce publications…to develop the skills for writing more usable information, understand the ways people use program products, and understand our procedures (such as the Architecture Review Board) for ensuring that information is usable," including one I developed and taught on "Writing for Reader Understanding," which focused on principles of gestalt psychology, learning, and memory (Dean, 1982).

But the first action of the study group (in 1979) was to define ease of use as we "understood readers (i.e., systems users) to perceive it," and we actually interviewed people and studied readers' comments to learn their perceptions. In my opinion, we only confirmed what we already knew from being self-conscious readers ourselves: "readers think information is easy to use when it is easy to find, easy to understand, and task-sufficient." We identified what we called "the nine ease-of-use factors." (Dr. Smart is basically correct in assuming that "IBM [sic] based the seven dimensions of *PQTI* upon customer need and feedback.")

$9 = 3 \times 3$

Why *nine*? The answer lies with Pythagoras and Euclid. The symmetry of a set of three triples

attracted me irresistibly. If I had thought that the study group was about to identify *eight* factors, I would have argued for a ninth, or, if it were about to identify *ten*, I would have argued for combining one of the ten with something else. I don't remember, but that, in fact, might have been exactly what happened. You see, I wanted to create a physical object that would capture the essence of ease of use, and I saw that a little triangular pyramid would fit the bill admirably, particularly because the triangle was a prominent architectural motif at IBM's Santa Teresa Laboratory. I set about manufacturing a few of these pyramids, using card stock and tape. Alas, none has survived, although my wife Carolyn thinks she saw one as recently as ten years ago (maybe it is somewhere in our attic). But from a 2-dimensional version that I worked up for a poster (and did find among my memorabilia), I have been able to reconstruct the template that my wife and I folded and taped on the kitchen table (Figure 1).

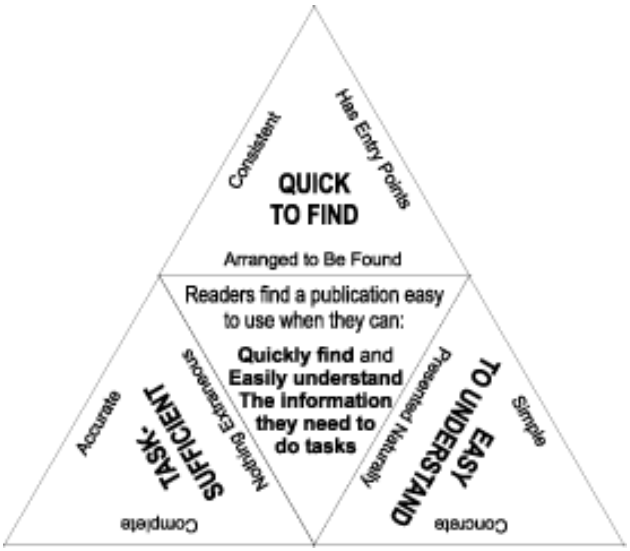

Figure 1. Template for the ease-of-use pyramid

Since I mention the kitchen table, you might conclude that usability had become somewhat of a Dean family thing. I did discuss usability with Carolyn, and also with our 12-year-old son Geoff, who drew the cartoon shown in Figure 2 (dated February 7, 1980, about the time I donned a rented Superman costume to appear as Usability Man at a System Information rally).

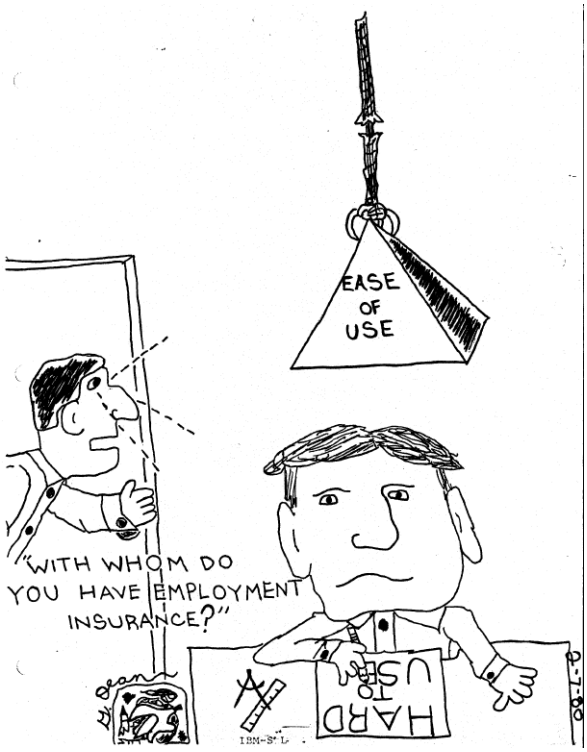

Figure 2. "The Unbearable Lightness of Ease of Use," by Geoffrey W. Dean

If the apparent weight and use of the pyramid in Geoff's rendering is any indication, he seems to have shared Dr. Weiss's understanding of the IBM corporate persona. A recent note from Geoff concludes:

> To me, that project *was* IBM, because that was what I saw of your work at home. "IBM" and your "work" were vague concepts, but Usability Man was more specific and seemed lots more fun and more connected with people than "computers," which I identified with rooms filled with whirling, number-manipulating machines, not with communication.

An eight-panel ease-of-use reference card that I put together the same year shows a variant of the triangle design (with a minor adjustment of the nomenclature) (Figure 3).

***Figure 3. Ease-of-use triangles from* IBM Ease-of-Use Reference**

The card even cites *The Elements of Style* and, curiously, *Experiences in Visual Thinking* (McKim, 1972), which I threw in less for its practical advice than as a reminder to communicate visually as well as verbally, and which foreshadowed the introduction in *Producing Quality Technical Information* of "visual communication" as one of the qualities. I had an ulterior motive as well for citing McKim, whose fascinating book had come to my attention in a 1975 UC Extension course in "creative problem-solving" (Edwards, 1975). I hoped that the title alone might prompt developers who referred to the card to be creative in following the rules, not to just follow them.

9 – 3 + 1 = 7

I may have been tepid about serving on the Architecture Review Board, but that was not my reaction to the idea (1981 or 1982) for STL editors Fred Bethke, Bill Calhoun, and me to devise "a checklist (as Dr. Bethke recollects) of things that editors would be looking for (and writers would incorporate) in documents that were to be easy to use." Dr. Bethke thinks that at one point we identified 47 items. None of us liked the idea of a long, bald checklist, and we saw that "some prose help would be nice." At this point, *Producing Quality Technical Information* was conceived, for I suggested that whatever we produced should exemplify the good writing that we were promoting. System Information manager Pessin supported the idea, and the manager of the editing department, Dewey Beaudette, introduced graphic designer Neumann to me. The rest is history.

We had *nine* ease-of-use factors in 1979 and 1980 (and 1981?). Why, then, did we have only *seven* in 1982, when we prepared *PQTI* for its 1983 publication? And why did "*usability* somehow morph into *quality*?" as Dr. Bethke puts it. Good questions, which I'll try to answer.

Quality first. Consider the phrases, "producing easy-to-use technical information" and "producing usable technical information." Doesn't the first phrase seem a bit long to you? And doesn't "usable" in the second seem rather prosaic? I think we liked the sound and sense of "producing quality technical information" better. Maybe it was as simple as that. And we may have been under the influence of an eccentric, mystical book that was forever (it seemed in those days) being featured in ads to join the Book-of-the-Month Club, *Zen and the Art of Motorcycle Maintenance* (Pirsig, 1974), whose narrator meditated on quality as a sort of Platonic ideal. At any rate, it seemed to me that information that was easy to use possessed certain *qualities* (retrievability, clarity, accuracy, etc.) that made it so. Thus "quality technical information" was information that had those qualities. Even the play on words appealed to me (and it still does).

Number. I think that the original number of factors may have fallen by the wayside in large part because nine exceeded the seven of "7 plus or minus 2," and we saw that we could profitably reduce the number to *exactly* seven, which, for most readers, was a small enough number for a single chunk without introducing the hierarchy of three threes. (Now that I sometimes have to work at remembering a telephone number, I am not sure that seven was a small enough number!) But we didn't simply subtract two of the factors to get seven. A comparison (Table 1) of the nine factors of 1979 with the seven qualities of *Producing Quality Technical Information* (the left and middle columns) reveals that some of the factors have merged with or been absorbed into others, and task-orientation has been promoted to first place as a quality in and of itself (with the other six qualities remaining in their original sequence of find, understand, use). Task-orientation had been the crucial idea propelling the work of the 1979 study group, and its influence remained.

	The 9 *Factors* of 1979	The 7 *Qualities* of *PQTI*	The 9 *Characteristics* of *DQTI*
Find	3. Arrangement 1. Consistency 2. Pointers	2. Organization 3. Entry points	7. Organization 9. Visual effectiveness 8. Retrievability
Understand	4. Simplicity 6. Naturalness 5. Concreteness	4. Clarity 5. Visual communication	4. Clarity 6. Style 5. Concreteness
Use	8. Accuracy 7. Completeness 9. Exclusion	6. Accuracy 7. Completeness 1. Task-orientation	2. Accuracy 3. Completeness 1. Task-orientation

Table 1. Comparison of the 1979,* PQTI, *and* DQTI *arrangements of the elements (numbers in the rows of the three columns indicate the sequence in which the elements were presented, with corresponding elements in the same row)

Drs. Mandel and Smart refer to the Prentice Hall editions of *Developing Quality Technical Information* as having expanded the number of "quality characteristics" (emphasis mine) to nine and organized them into three groups of three. I don't know whether this was an expansion or a reversion, but the nine "characteristics" of *DQTI* are not literally the same as the original nine "factors." Significantly, *DQTI* retains task orientation (now without the hyphen) as a separate characteristic, and in first place. It reverses the sequence, *find, understand, use,* to *use, understand, find*, in order to keep task orientation next to its cognates, accuracy and completeness. Visual effectiveness is now grouped under "easy to find" rather than under "easy to understand," and concreteness has come back…

But enough. Though such comparisons are fun, we have to remember that we are comparing somewhat arbitrary arrangements. The 1979 study group, the preparers of *Producing Quality Technical Information*, and the editors of *DQTI* have all done the same thing, sliced the pie into the number and size of pieces they wanted at the time. It's roughly the same pie.

Philosophical about it

Dr. Smart observes that *Producing Quality Technical Information* "articulates aspects of quality we often take for granted and makes explicit what we sometimes value implicitly." This captures well what I thought we were doing in the years 1979 to 1983. Using the simple, overriding, "says it all" concept of usability (or quality) as "easy to find, easy to understand, and task-sufficient," we intended in our work on *PQTI* to make sure that writers and reviewers who followed its advice (and just its advice) could not fail to "produce quality technical information." (I of course acknowledge that our understanding was imperfect and that we missed a number of points so ably identified by the commentators.) My procedure amounted to following the Platonic or Kantian creative principle that if one has a simple (and true and valuable) concept at the outset, one can work out its useful implications top-down almost mathematically and ensure their completeness and articulation. Of course, where did that "simple concept at the outset" come from? My colleagues and I did have some experience in writing and editing technical documentation (Platonic *remembrance* of the Kantian *ding an sich*?). I think we had the blessing of Wittgensteinian common sense in the way we thought about what we were doing.

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