APPLIED THEORY

SUMMARY

- Argues that writing is the core technology that all IT systems attempt to leverage to make these systems more valuable
- Also argues that technical communicators have a central role to play in IT systems consonant with their core competencies

On Writing, Technical Communication, and Information Technology: The Core Competencies of Technical Communication

WILLIAM HART-DAVIDSON

CHANGING PARTNERS: THE SHIFT FROM ENGINEERING TO IT

If technical communication once was the companion to engineering, it is now a partner in the business of information technology. In his February 1999 editorial for *Technical communication*, editor George Hayhoe noted that the majority (60%) of STC members work in the information technology field, up from 30% in 1985 (p. 23). And these numbers, impressive as they are, counted IT-related work only according to the kinds of products/services the businesses sold (computer hardware, software, and services) rather than the by the actual job descriptions of the STC members. With nearly every business reinventing itself for the Internet, it would not be surprising that the percentage of STC members who spend at least some of their time creating or testing Web content, designing online help, or documenting increasingly Internet-dependent projects and practices is much higher than 60% of the membership.

With this shift to information technology, there has arguably been a corresponding rise in the status of technical communicators in the workplace as, more and more, the exchange value of an information product is associated with aspects of quality that technical communicators have the expertise to look after: customization for specialized or niche audiences, ease of use, and scalability. Even more dramatically, the possibilities of new technology trends such as "single source" authoring have the potential to elevate the status of technical communicators even higher as content delivered on the Web becomes the product, and pages of information comprise the interface. Technical communicators, some have suggested, are well positioned to meet several growing needs: systems that provide customized, yet flexible and reusable content, and information that is dynamic yet stable, reliable, and usable (Hackos and Rockley 1999).

If the last two sentences made you nervous—big optimistic claims laced with buzzwords—then read on, because this article is concerned with the reason why technical communicators are often confronted with visions of our future (visions that seem to alternate between utopian and distopian views of the profession, depending on who is conjuring them) in language that doesn't always sound familiar.

Michael Albers, assessing the future of technical editors in what he sees as the coming single-source era, paints this portrait.

> *Multiple writers at multiple locations contribute information to a document database which then, on reader request, dynamically generates a unique document fulfilling current reader needs. What the reader sees is not a document that an editor has carefully groomed, but rather a dynamic document that was compiled from a database just before the information was presented. (Albers 2000, p. 191)*

In this description, Albers resists proclaiming whether single-source technology means a new beginning or an ultimate end to technical editing. He does note, however, that the development of these technologies that seem so plainly intertwined with the expertise and day-to-day work of technical editors remains largely in the hands of "computer

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science researchers" who are "actively pursuing research programs in adaptive hypertext and information retrieval" (p. 191).

One question I wish to raise with this article is, simply, why not us? Why aren't technical communicators themselves seen to be the pivotal players in the design of systems that support single-source authoring? More broadly, why aren't technical communicators seen as an important group shaping content delivery and management technologies for the Web? Let me frame the central question a bit more productively: by what means can technical communicators in the workplace and in academia work to shape the emerging technologies that not only affect the work we do but that are growing up, figuratively speaking, in our own backyards? . . . technologies that seek to harness the rhetorical expertise of technical communication and leverage the ancient technology of writing, the most widely "installed" IT platform in the world.

A THEORY GAP

In raising the question "why not us?" I run two risks that I want to acknowledge at the outset. First, I risk downplaying the efforts of technical communicators in the workplace and in academia who are already working to impact technologies that are transforming technical communication. I certainly do not mean to do so; rather, my aim is to point out the need for such work so that the field can better recognize those who have been working in areas such as usability and user-centered design on the workplace side and, on the academic side, those who have become increasingly active in shaping both the theory and tools that drive innovation in technical communication.

The second risk I face in asking "why not us?" comes as a result of my provisional answer. I suggest that our field lacks a theoretical orientation to our work with information technology that would make leadership in the IT field seem reasonable, possible, and desirable. With this claim, I risk rekindling a familiar and (to some) tiresome debate about the place and value of "theory" in technical communication. My claim, put another way, is that at least part of what has held technical communicators—both in the workplace and in the academy—back is a lack of adequate theory that makes our expertise sufficiently portable in times of technological change.

In my own experience in both workplace and academic settings, I have found that the knowledge and skills of technical communicators is, indeed, in high demand at the highest levels of technological decision-making: research, policy, business planning, management, and design. Trouble is, few people know that this expertise is native to technical communication. Few know to look for the knowledge and skills technical communicators bring to such complex problems as managing the massive amounts of unstructured data that currently makes up the World Wide Web or balancing the need to provide relevant, customized, even personalized information to an audience that is increasingly diverse. Who does these things, anyway?

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Technical communicators in the workplace deal with these problems every day. But they have often done so without much recognition by others of the kinds of expertise they martial to do so. Academics who study rhetoric would recognize the issues mentioned above as truly ancient ones, with fundamental concerns about how to deal with the messiness of enthymemic rather than syllogistic discourse, or how to strike the appropriate balance of appeals to a broad audience. These issues echo as the stuff of Corax and Tsias, Gorgias, Isocrates, Plato, and Aristotle, uttered long before they were the concern of IBM, Lucent, or Cisco.

Perhaps one of the more ironic unifying claims one can make in the academy/workplace debate is that technical communication has been a practical endeavor on both sides of that divide, a fact that has left both groups struggling in transitional times of economic downturn or explosive technological change to make and remake the case for technical communication's survival. So while I acknowledge the risk of raising "the theory question" yet again, I don't wish to argue that the theory-makers are the academics and that the theory-appliers are the workplace professionals. A bit later, I will try to offer a framework for understanding what I mean by "practical" and what, other than practical concerns, may be valuable areas of endeavor for technical communicators.

WHY DO WE NEED THEORY IN TECHNICAL COMMUNICATION?

I do not agree with those who hold that the only reason we in technical communication have theory in the first place is due to the rise of academic programs in technical communication in departments of humanities where publishing requirements and graduate programs demanded some kind

of underlying "theory" to justify the discipline (Tebeaux 2000). As an academic on the tenure track myself, I don't deny that these pressures exist. But I also cannot deny the pressures I have felt in the workplace to articulate the basic concepts that underlay my value to a software development effort, for example, when working with the project team or communicating with management. When there are no labels, no language, for these concepts, my contributions have seemed, at best, mysterious to my coworkers. They often get characterized as the product of personal skill or effort, rather than a result of any identifiable body of knowledge.

Among technical communicators, in fact, it is often the case that our colleagues eschew any connection to theory, claiming as "talent" the apparently unique abilities an education in the art of rhetoric; in the processes of writing, research, or audience analysis; and in the skills in wielding the technologies of writing provides us. This "theory arrogance" as some have called it, is found on both sides of the workplace/academy divide, and so my claims here won't single out either group. My argument is much more simple.

We need theory. By this I mean that the ranks of working professionals *and* academics in technical communication should participate in activity that makes the core expertise of technical communication explicit. Moreover, we should seek to extend that core expertise not only by raising new questions and researching new possibilities, but also by inventing new information technologies that build on these areas of expertise and shaping IT policy in both the public and private sector.

In an effort to frame the kind of theory work I am advocating and anchor it in the practice of real-life technical communicators, I want to take advantage of the rhetorical space this special issue of *Technical communication* opens up, a space more tolerant of reflection and question raising, perhaps, than the typical issue. I want to begin everal of what I hope are taken to be important discussions, each with the potential to shape an individual technical communicator's career, a documentation project team or department's strategic plan, a technical communication graduate student's research goals, or a technical communication program's curriculum. Consider each of the sections that follow, therefore, as topics for conversation as well as arguments meant to ignite the discussion.

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ARGUMENT 1: WRITING *IS* IT

As someone who studies writing for a living, I have found it both refreshing and a bit disconcerting to hear theorists and researchers who study or design computer systems for a living marvel at the power, flexibility, and potential that the practice and artifacts of written discourse reveal on careful examination. Take for example, the following statement made by Lucy Suchman, respected human-computer interaction researcher and author of *Plans and situated actions: The problem of human-machine communication.* Suchman's remarks were part of a keynote speech addressed to an international conference of human-computer interaction researchers in 1997.

> *. . . the problem of mutual intelligibility between humans and machines recommends a research agenda aimed less at the creation of interactive machines, than at the writing of dynamic artifacts intended to be legible, or intelligible to their users. This shift brings a rich set of resources from recent reconceptualizations of what writing and reading involve, including the inevitable uncertainties in relations of writer's intentions to readers' interpretations, and the active role of the reader in giving life and meaning to the text.*

There is a certain amount of pride to be taken when, as a long-suffering technical writer, one hears the more prestigious work of IT design recast in familiar terms as the work of the writer. The pride fades a bit, perhaps, toward the end of the passage as Suchman (1997) expresses excitement for tenets those of us who write and research writing recognize not so much as "recent reconceptualizations" but rather as ancient arguments reinvigorated. But the underlying assertion Suchman makes here is worth discussing among ourselves: what is it about writing that is makes it so important, analogously or directly, to the design of any information technology? Are there fundamental features at the core of written discourse, itself a technology, that make it the indispensable starting point for IT design of other sorts? I believe the answer to the latter question is "yes." The answer to the former question, though, demands a bit of theorizing.

As Ong (1982), Havelock (1988), Bolter (1991), and others remind us, writing is a technology. Perhaps more accurately, writing might be understood as an array of technologies focused on the production, display, distribu-

tion, storage, and recall of information. It is no accident that the five ancient canons of rhetoric isolate these very features: invention, arrangement, style, memory, delivery. We might think of the canons of rhetoric as the basic operating system features of writing. At the core of this OS, perhaps the most basic component of the technology array, is the written sign. Without getting into the significant issues related to ideographic as opposed to alphabetic forms of the written sign, let's consider two features of the sign that make it so useful as an information technology. In doing so, I will paraphrase another theorist whose name I will withhold, just for a moment, so as not to muddle the point.

Two technical specifications of the sign

1. The sign is a mark that can be reproduced. Over and over again, we can reproduce the sign, ad infinitum. A key to its utility, the "iterability" of the sign must be infinite.

2. The sign is a mark that can be interpreted, over and over again, without exhausting its meaning.

Because both of these technical specifications are present in the written sign—that is, the sign is at once infinitely iterable and inexhaustible in terms of its interpretability—we can now describe two of the most powerful functions—perhaps we should call them "affordances"—of writing as a technology.

Two affordances of writing

1. The written sign is not bound by the context in which it was originally produced. It is free to travel, to persist, to reappear, and to present itself for reinterpretation in contexts far removed from those it was conceived in temporally, geographically, and culturally.

2. The written sign operates perfectly well in the absence of its author, scribe, or sponsor. Although it may be employed in the interest of communicating the intention of one or more of these role players, it is not bound by intention, nor is it altogether hindered by either the absence or presence of these players.

Forgiving my own authorial license in assigning, with the active voice, what appears to be agency to the written sign (a habit acquired reading and writing descriptive copy about software products and the wonders they perform for us, perhaps . . .), you will notice that the two affordances mentioned above flow directly from the technical specifications mentioned earlier. Because the sign is simultaneously reiterable and interpretively inexhaustible, it has the potential to outlive the material and social conditions in which it was created.

Its value as a medium for inventing, say, long and complicated arguments or descriptions lies in the power afforded to an author who can string together signs of shared meaning in a particular community, re-read and refer back to them, rearrange and remember them without undue effort, all the while knowing that the message can be stored, distributed, and delivered intact at a later time, in a different place, or even across many times and many places. These are the same basic features we celebrate in just about all IT platforms, in fact, from local databases to vast, shared networks. All of them build on the two specifications that characterize the sign.

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And because the sign is interpretively inexhaustible and infinitely reiterable (in that reverse order, perhaps) it also tends to communicate without need of any author or writer nearby, often, as Plato famously lamented in *The Phaedrus*, to the contrary and much to the dismay of the author who wrote it. This feature is especially valuable for the formation of complex social organizations such as businesses and governments who leverage the power of authorial fluidity the written sign affords to create more efficient and effective workflows, to reuse particularly successful documents or parts of documents, or to create and reserve ownership rights to information while distributing it to the world as a commodity.

Whose argument have I borrowed?

Jacques Derrida. Yes, the French theorist most often recognized as a literary or social critic. He doesn't appear in these pages very often, I suspect, nor should he. But, to briefly return to our introductory theme, an occasion when he might be invoked would be when we as technical communicators need to make our expertise relative to information technology more portable and more obvious. This is one of those times.

The discussion I reference above about the nature of the written sign appears throughout the work of Derrida, but it is perhaps most famously concentrated in an article entitled "Signature, event, context" written in 1977. The article is a response to the work of John Searle, a speech-act theorist, who, it seems, Derrida felt had too hastily moved to reassert the logical primacy of speech as the most natural communicative act. Writing is secondary to speech in this view, merely a transcription of language in the head. Derrida presented a radical reply to this view, claiming that the very nature of communication with symbol systems depended on the two fundamental qualities of the sign discussed above: the infinite iterability and inexhaustible interpretability of the sign.

These two features, Derrida explains, are most fully realized—or we might say "most effectively leveraged," nowadays—in written discourse. In fact, speech, claimed Derrida, may only be a special case of the more basic act of communicating with reiterable, interpretively inexhaustible symbols. That is, speech might simply be understood as a rather odd misuse of the sign in which the persistence of the message is compromised by the medium and, therefore, our perception of the value of the context and authorship of the message is inappropriately skewed.

Now, before we dismiss Derrida for pulling another of his famous deconstructive reversals, wherein his tact is simply to argue the opposing binary relationship to the one that seems most like common sense, let's consider how this view of the primacy of writing might actually make more sense in the context of information technology. Actually, I want to consider how two other theorists have used Derrida's understanding of writing to make arguments relevant to technical communicators.

SLIPPERY IDENTITIES

In *The mode of information*, theorist Mark Poster argues that Derrida's position on writing illuminates the changing status of the writer's identity when we consider it in light of computerized writing technologies (Poster 1990, p. 110). Poster is intrigued by the way writing technologies such as the word processor, for example, take the idea of the written sign operating independently of its originator and radicalize it, causing a confusion amidst the very act of writing about where the ability, and responsibility, for writing lies. It is this kind of confusion, I suggest, that is causing the angst Michael Albers and others wary of single-source authoring systems express.

For Poster, the question of fuzzy identity begins with the ability a word processor gives us to render signs in graphic form that are, nonetheless, much more changeable and reiterable than those rendered on paper, in stone, and so forth. Signs on the screen are signs standing for signs, magnifying the effects we are used to getting from writing. Poster suggests that as we are able to move seamlessly between searching our mind for a term and, say, searching an online thesaurus, or as we can drag-and-drop paragraphs just as easily as we rearrange them in our heads, we easily lose sight of the boundary between the writer and the machine (p. 112). Which is the act of mind and which the act of the machine?

When this question is raised, we also lose sight, I would argue from the technical communicator's point of view, of the location of the expertise needed to pull off something as potentially complex as rearranging paragraphs to form a better argument. The basic rhetorical moves that the word processor is able to leverage (at least four of the rhetorical canons, in these two examples: arrangement, style, memory, delivery) become attributable to the machine as, according to Poster, we see that "the program achieved 'an act of recognition or recall' that resembles successful acts of the brain" (p. 112).

The identity of the writer, already made unstable by the iterability and infinite interpretability of the sign in traditional print formats, becomes unstable even at the point of composing the message. We might start to believe that just as the finished text can be bought and attributed to authors who never had a hand in producing the manuscript, the in-progress text might arise from the machine, absent the writer or long after she has gone. This is, after all, the dream of single-sourcing: that we can automate invention if only we better control arrangement, style, memory, and delivery.

There is no doubt, as Poster persuasively argues, that computerized writing goes a long way toward erasing any unique or personal qualities an individual might bring to the act of writing or to a written text merely in the way signs are encoded, stored, displayed, and recalled. There is no distinctive handwriting characterizing your fixed disk from mine, and no clever local meanings applied to database query terms in your own vernacular. The computerized sign is, if anything, more likely to contribute to the fluidity of identity on both the production and consumption side of communication. That is, computers make it far easier for both acts of writing and the results of those acts—texts, images, and so on—to be distributed across organizations, shared among teams, used, and reused in a wide variety of contexts. But the possibilities of fluid identities require sophisticated handling so that we might make the most of them, on both the production and consumption sides.

Who should handle these possibilities, wherever they may arise in IT systems? Technical communicators.

FLEXIBLE STRATEGIES

Like Poster, Johndan Johnson-Eilola takes Derrida's view of writing "to the screen" to show how the infinite iterability and interpretability of the sign underlies the power of information technologies as well as our ability to create and sell information "products." For Johnson-Eilola, the identity of the entire profession of technical communication as either a "service" to IT/engineering production or as "sym-

Signs on the screen are signs standing for signs, magnifying the effects we are used to getting from writing.

bolic-analytic work" necessary in the whole life cycle of the development of information products hinges on understanding a version of Derrida's view of writing. This Derrida connection is perhaps most evident in his discussion of hypertext writing.

In *Nostalgic angels: Rearticulating hypertext writing,* Johnson-Eilola acknowledges the interesting paradox of hypertext, noting that it is by definition already "deconstructed" because it consists, in its native form, of distributed chunks of information—some of which might signify text, some images, some links, some executable code, and so forth. Yet the text is still experienced by the reader/user as a relatively real, coherent thing. The text can exist as a whole, but it does so only as an "effect" (1997, p. 149).

This feature of hypertext makes it possible for us to consider the dynamic relationship between information and the way that information is integrated with the situated behavior of those who will read or use it. In Derrida's terms, we can begin to imagine how the inexhaustibility of interpretation afforded us by the written sign might be taken a step further, to the point of creating information "products" that enable users to make the most of this fluid interpretability.

For example, the deconstructed or disarticulated nature of hypertext makes it well suited to the representation of task sequences. In the case of online help for software applications, we are able to bring information into closer proximity to the user's task environment than we can with printed documentation. We can present it in smaller, more situation-appropriate formats, and so on. In short, we can leverage the disarticulated nature of hypertext to blur the boundaries of "the application" or "the interface" and "help" such that task support, in whatever form, becomes the overall goal of the design of the product. Help is not merely a text or a menu to access online bites of text; rather, help is a core function of the information product itself.

Now—here comes the Derridean part—to the degree that we can maximize the user's chances to successfully interpret the network of signs that make up the application interface and even the back-end code, the better the quality of our product. The whole product consists of signs, but the ones that combine to form representations of likely user task sequences—well, those are the most valuable for ensuring a usable product.

My example of online help, above, takes Johnson-Eilola's work in *Nostalgic angels* a bit further than he might recognize. The online help discussion more accurately reflects a more recent article by Johnson-Eilola called "Relocating the value of work: Technical communication in a post-industrial age" (1995). Borrowing a definition of *symbolic-analytic work* from Robert Reich's *The work of nations*, Johnson-Eilola suggests four kinds of value-added activity that technical communicators perform in relation to what I will call the computerized sign—that is, the written sign as it exists in a computerized form. These four kinds of activity are the hallmark areas of expertise or core competencies of the symbolic analytic worker, according to Reich. For Johnson-Eilola, these basic competencies fit well with responsibilities of technical communicators. The table below shows Reich's categories on the left, along with my paraphrase of a corresponding activity appropriate for technical communicators suggested by Johnson-Eilola on the right.

TABLE 1: FOUR KINDS OF VALUE-ADDED ACTIVITY THAT TECHNICAL COMMUNICATORS PERFORM

Symbolic-Analytic Competency	Corresponding Technical Communication Activity
Experimentation	Usability research that questions the ends and not merely the means of information and task-support delivery in an information product (Johnson-Eilola 1995, p. 258)
Collaboration	Working on distributed teams with an attention to the success of the collaborative practices used, and a commitment to improving them (p. 259)
Abstraction	Finding and articulating patterns, structures, and relationships in large amounts of information that is typically amassed but either unstructured or structured in ways that limit the use of the information (p. 260)
System Thinking	Finding and articulating patterns, structures, and relationships across specific problems, projects, and task domains; moving from tactical to strategic thinking that can impact large social structures such as the enterprise, the market, the community, the state (p. 261)

The interesting challenge that technical communicators face every day is how to make the most of this feature of the written sign to capture, represent, and refine social practices, particularly work practices.

Johnson-Eilola argues that while the first three are, perhaps, becoming more common in the day-to-day work of technical communicators, they are rarely valued as core competencies of the technical communicator. The fourth area, system thinking, is usually seen as beyond the scope of the technical communicator's work.

What I'd like to point out about this list, though, is what each of these four areas has in common. Each requires an attention to work practices such that day-to-day and highly situated activities are reflected on and are represented so that they can be improved and reemployed in future situations. Each is also endemic to building IT products and systems that improve social relationships in businesses and organizations. That is, the IT product that succeeds will rely on someone doing each of these four things well in the course of its development. Who should that person be? Who should look out for those flexible strategies that can be noticed, recorded, refined, and redeployed to make work practices—or products meant to enhance work practices—better? Technical communicators.

ARGUMENT 2: AS CUSTOMIZED AS NECESSARY, AS GENERALIZED AS POSSIBLE, OR THE CHALLENGE OF ATTENDING TO IDENTITY AND STRATEGY IN IT SYSTEMS

So far, I have argued that technical communicators are the ones who attend to two critical issues in the context of developing information technology: slippery identities and flexible strategies. Both of these issues, I have further claimed, arise from the nature of the written sign, which is the core technology in any IT system. Slippery identities and flexible strategies aren't merely problems to be overcome but rather are the very basic features of IT that must be successfully leveraged to make ever more effective information products.

In this section, I'd like to make a case for how technical communicators ought to approach their work attending to identity and strategy in IT development.

The title of this section gives away the argument I will make. I will suggest that technical communicators are most appropriately charged with maintaining a balance between bringing a highly customized product (that is, strongly connected to the specific needs and desires of the intended users) to users that is, at the same time, comprised of components and produced through processes that are as generalized—and therefore as reusable—as possible. Information products that are as customized as necessary and as generalized as possible. A tricky task, to be sure, but one that should sound very familiar already to technical communicators everywhere. Making this case, once again, calls for a bit of theorizing.

The way technical communicators deal with slippery identities and flexible strategies is fairly consistent.

On the identity front, we generally try to create texts and contribute to communication process that move from highly personalized and tailored to the individual reader or writer toward texts and processes that are more easily generalized, applicable to a wider audience, or executable by a wider variety of individual communicators. Where the identity of readers is concerned, the challenge is an ancient one: how to frame a message for a diverse audience that nonetheless touches each individual?

On the strategy front, the trajectory is similar. Technical communicators capture and represent practices that are situated, context dependent, and tailored to a particular group of people in an attempt to make these more generalizable, repeatable, and therefore useful in future and unforeseen situations.

The reasons behind these trajectories—moving from fragmented to stable, specific to general, fixed to flexible—include a number of compelling benefits. From a financial standpoint, the ability to reuse a successful strategy or to address a wider audience with a similar message frequently translates to monetary gain due to increased efficiency and wider market appeal. From a management standpoint, as ad hoc processes and tailored solutions to specific problems become increasingly recognized as "best practices," preparing new team members becomes easier, and ensuring reliable service to customers becomes possible.

From a rhetorical standpoint, the ability to synthesize cross-context strategies from specific cases and the ability to create discursive appeals that unite diverse groups are also desirable ends. Taken together, issues of identity and strategy help to describe where the value of the technical communicator's expertise lies: in framing the most effective message for every likely reader or user, and doing it in a way that most effectively captures the nuances of highly situated circumstances yet applies to all relevant ones.

Writing as an information technology enables this fascinating problem/possibility, once again, because it can be both highly specific and freely interpretable outside its context and away from its author. The interesting challenge that technical communicators face every day is how to

make the most of this feature of the written sign to capture, represent, and refine social practices, particularly work practices. Texts, interfaces, network systems, and a host of other specific forms of IT have this broad aim. The question becomes "how might technical communicators claim this conceptual territory in a way that others might recognize?"

Mapping the conceptual territory of strategy and identity

In his recent book *User centered technology: A rhetorical theory for computers and other mundane artifacts*, Robert Johnson makes an important call for participation in technology theory by technical communicators. He wonders why, with technology being central to the work of this particular group, more scholars in the field haven't made contributions in this area. He then goes on to note that there *have* been several important contributors, including Carolyn Miller, Charles Bazerman, Greg Meyers, and Dale Sullivan. I would also hasten to add Cynthia and Richard Selfe, Craig Hansen, Ann Hill Duin, Johndan Johnson-Eilola, Patricia Sullivan, James Porter, Stephen Doheny-Farina, and Stuart Selber.

Johnson's aim, though, is to take the disciplinary discussion of technology—particularly the discussion emerging about user-centered design—more mainstream in the field of technical communication. He identifies three specific domains in which he feels technical communicators might contribute: the social, ethical, and political arguments surrounding technology.

Beginning with the idea that the user should be the ultimate "end" of technology design, Johnson argues that the user's situation—the context in which a user will be learning, using, or helping to produce a technology—represents a primary and largely overlooked dimension of technology design. Aside from the obvious connection this bears to a rhetorical view that requires sensitivity to audience, context, and purpose, Johnson's model of user-centered technology design helps him to argue that technical communicators can contribute to technology theory and practice in three areas where we usually have only limited say: the social, ethical, and political arguments about technological development. What I would like to offer is a framework within which we can see the arenas of social, ethical, and political arguments in relation to the core competencies of attending to slippery identities and flexible strategies.

Figure 1 shows a matrix, with *strategy* on the horizontal x-axis and *identity* on the vertical y-axis. The two axes describe conceptual spaces where it is possible to identify what the terms *ethical*, *social*, or *political* discourses might mean in relation to strategy, ranging from flexible, cross-context strategies to situated, context-dependent tactic; and identity, ranging from highly stable, unified identities to more fluid, fragmented identities.

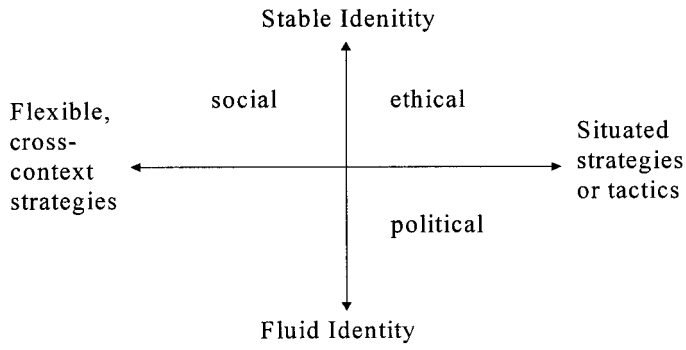

Figure 1. Mapping the social, ethical, and political discourses of technology.

In this conceptual space, for example, *ethical* arguments about technology are those that tend to consider more-or-less stable identities, grouping people together and considering unifying aspects of identity rather than isolating individuals or magnifying difference. However, ethical arguments also tend to attempt to reconcile these relatively stable identity concepts with what are nonetheless highly situated, often volatile actions, presumably in the interest of coming to a judgment about an appropriate course of action in a specific situation. To put it more simply, James Porter characterizes ethical discourse as that which aims to determine a *should* for a *we* (1998, p. xiv).

Political arguments, as positioned on the chart, involve both the consideration of fluid, fragmented identities and situated tactics applicable to specific contexts, mostly in the interest of shaping relations of power in those contexts. These arguments, we might recognize, tend to work in the interest of certain people in certain conditions and not others.

Social arguments occupy the opposite quadrant and, accordingly, would attempt to support broader arguments considering stable patterns of action or cross-contextual strategies and the kinds of *we* or *they* categories that constitute more stable identities.

Consider an IT issue such as the recent controversy over Napster. Napster offers resources that allow users to share copyrighted music files through a peer-to-peer network in a way that may violate the law. Arguments about Napster could be placed in different areas of this chart depending on the view of strategy and identity adopted in each. For example, social arguments in the Napster controversy would point to broad patterns of behavior and attempt to match these with stable identities, producing statements such as "College students are downloading MP3 files at an alarming rate, taking advantage of the fast, free Internet connections they have access to at colleges and universities." Another social argument might be "Despite or perhaps because of Napster's prominence in the news,

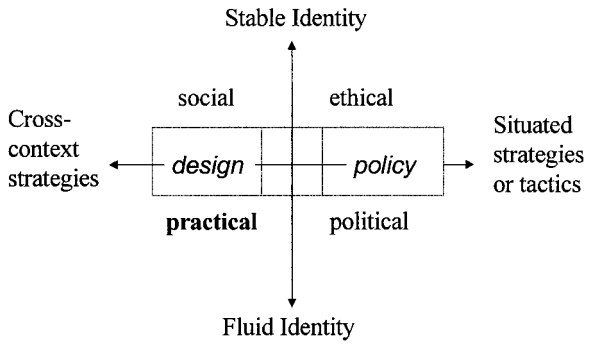

Figure 2. Likely domains of influence for technical communication.

sales of CDs are actually up significantly over last year, causing record industry analysts to ask, 'Is it such a bad thing?'"

In both of these statements, cross-context actions are combined with broad identity markers: college students are downloading; analysts are perplexed by an apparent contradiction in the record industry's arguments against Napster that it will hurt sales and the boost in sales that they are experiencing.

Ethical arguments might adopt similar identity categories but seek to specify the conditions of any particular act of "downloading," for example, to point out the differences between acquiring a freely distributed MP3 file from a group trying to get noticed as opposed to acquiring one by an established artist who has publicly denounced Napster.

A political argument would attempt to play out specific tactics and highlight the fragmented identities, pointing to the ways specific players in the controversy might gain or lose from particular courses of action.

The purpose of mapping these areas is to show what I would call "likely domains of influence" for technical communicators to enter these sorts of discussions. Specifically, I'd suggest that it is in the spaces where identity and strategy are closely aligned, near the origin of the matrix if you will, that technical communicators can make the most reasonable entries. The revised chart, in Figure 2, shows what I mean.

This version of the chart highlights the area on the right-hand side, moving toward situated strategies but including a range of identity positions, as a location for discussions of IT policy. On the left, moving toward more cross-contextual strategies, are discussions that comprise IT design. Also noteworthy in this revision is the heretofore missing fourth term, the realm of practical discourse about technology, which tends to focus on framing cross-context strategies for rather fluid identities. In this conceptual space, for example, we can imagine software documentation that attempts to bring broad, conceptual, task-specific help to users who may run the gamut between novice and expert and who may be operating in widely divergent contexts of use, technologically speaking.

Note that as Carolyn Miller (1989) argues, when describing the work of technical communicators, the term *practical* should not be used to limit the responsibility of writers to work ethically and responsibly. In Figures 1 and 2, the boundaries between the four issue areas are not as rigid as the diagram makes them seem; the areas are only made distinct by the way each discourse tends to handle the issues of strategy and identity. For example, the terms *practical* and *ethical* should not be seen as exclusive types of discourse but only as types of discourse that handle identity and strategy differently.

To summarize more succinctly the argument I am attempting to make with the chart: Technical communicators engage in arguments at the intersections of issues of strategy and identity all the time. But we are usually only recognized for those arguments that occupy one of four possible conceptual approaches to those issues: a practical approach.

I agree with Johnson, however, that the other three areas are ones in which technical communicators should have a more active role. Discussions of technology design, the chart argues, don't stop with arguments about the "practical" implications of the technology; they also include "social" implications. They try to bring together discussions of fluid identities and more stable identities to help determine what technology is or should be for users. Similarly, discussions of technology policy take the situated actions and contexts of technology use into account, attempting to reconcile fluid and stable identities to arrive at decisions that shape what we (or they) should or must do related to technology.

Technical communicators engage in arguments at the intersections of issues of strategy and identity all the time.

TECHNICAL COMMUNICATORS AND GARDENERS IN IT DEVELOPMENT CONTEXTS

I'd like to return to the question posed at the beginning of this article, which asked by what means can technical communicators in the workplace and in academe work to shape the emerging technologies that not only affect the work we do, but that are growing up, figuratively speaking, in our own backyards? My answer to this question might be something like "By focusing on the ways all IT systems try to harness the basic features of the written sign and working to create new features in these systems that help to optimize the balance of identity and strategy." To be a bit more specific, I'd like to talk

about a role the technical communicator might play in an IT design and development context.

The role technical communicators are well prepared to play in IT development contexts is that of "gardener." A gardener, according to Bonnie Nardi and Vicki O'Day, operates in IT-rich workplaces to "grow the productivity" of the enterprise by attending to what I have called issues of identity and strategy. They do this, according to Nardi and O'Day, to develop the technological expertise of the people with whom they work (1999, p. 140). Nardi and O'Day discuss the role of the "gardener" in their larger argument for applying an ecological and systemic approach to understanding organizational contexts infused with IT—"information ecologies." Some of the broad definitions of the gardener role could almost double as job descriptions for technical communicators:

> *Gardeners are people who can translate concepts and mechanisms back and forth between the domain of the work and the technology itself. They occupy a special niche in information ecologies, because they bridge the specifics of the domain, with its unique problems and challenges, and the capabilities of the tools used in the domain. (Nardi and O'Day 1999, p. 141)*

In this description, we can notice an attention to strategy. Gardeners translate ideas and processes to make continuous improvements to workplace practice. How, we might ask, do Nardi and O'Day suggest that gardeners accomplish these goals? The specific practices of a gardener differ and are tailored to each "ecology," but many of the things mentioned in the two studies Nardi and O'Day draw on to describe gardeners more generally would sound very familiar to technical communicators.

One of the their studies, for example, looked at a group of financial professionals whose primary information tool was a spreadsheet. Among this group, according to Nardi and O'Day, it was not unusual for the gardener to develop macros to help with routine tasks, to create charts and visual representations of data for presentations, to "create custom formats (such as a new way to show a value in a spreadsheet cell)," to write formulas for the spreadsheet, to help coworkers revise their spreadsheet designs, and to train coworkers in doing any of the above kinds of tasks for themselves (p. 142).

A second study, which looked at architects and the use of computer-aided design software, reported similar activity for gardeners. The CAD-context gardeners wrote macros and scripts, gathered conventions and set guidelines for standard terminology and documentation, evaluated new tools and techniques, and helped to train coworkers (p. 143).

The ecological focus of Nardi and O'Day necessarily construes each context studied as a unique information ecology, so it would not be accurate to say that the gardener role is just another name for technical communicator. As the description of the gardener's activities in the spreadsheet and CAD contexts indicate, task and domain-specific knowledge as well as expertise in programming or scripting enabled the gardeners to "grow the productivity" of their companies. Also important, though, was a command of basic and advanced writing and communication features at work in the information ecology.

It is this second skill set that we can readily associate with the technical communicator. And it is this second skill set that constitutes the primary asset a technical communicator would bring to any information ecology that aims to produce—and not merely to use—IT. In these types of workplaces, technical communicators are likely to be the ones who help a design team make the most of its own diversity, in terms of domain-specific expertise, by enabling cross-functionality and process efficiency wherever possible. T**C**

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