

CHAPTER 1

Users, Technology, and the Complex(ity) of the Mundane

Some “Out of the Ordinary” Thoughts

. . . the user, or, in other words, the master, of the house will even be a better judge than the builder, just as the pilot will judge better of the rudder than the carpenter, and the guest will judge better of the feast than the cook.

—Aristotle, *Politica*

The word “mundane” is an adjective that, when converted to a noun, describes the essence of the world from a user point of view. According to the dictionary,¹ *mundane* means “common, ordinary, or, of this world.” Users of technology work, play, and in virtually every way *live* in the world of the mundane—a complex and colorful realm that, ironically, remains practically invisible. The invisibility of the mundane is, I suppose, not surprising. As we go about the activities of our daily lives, doing things repeatedly each day, we internalize these actions and thus make them a part of our unconscious.

In part due to its invisibility, this site, this “land of the mundane,” has not been the focus of widespread research, especially concerning the role that users of technology play in this land. Many researchers have focused on the designers and developers of technologies, providing us with important interpretations of how artifacts “come to be.” Others have likewise

1. The *Random House Webster’s Dictionary*, 1993.

concentrated their efforts on the artifacts and systems that comprise the technologies of human endeavor. In this book, we will instead turn our attention to the everyday users of technology. We will make room for the developers, the designers, and the artifacts or systems of technology, but the primary concern will be to examine users and the phenomena of technological use from their perspective.

In this opening chapter, I will lay some groundwork concerning issues relevant to users and technology that will be developed throughout this book, but the structure of this initial chapter will not be conventional. That is, it will not be a review of the literature *per se*, but rather it will raise issues and ask questions that are investigated later in the text. We will begin by rethinking what it means to be located in the mundane in the purpose of describing the complexity, and the resultant complex of interactions that evolve as one probes this relatively unexplored land. Next, I will tell some tales of my own experiences that will help uncover more concretely some of the issues and questions concerning the study of users, technology, and the mundane. Finally, we will ask what it means to develop a theory of the mundane through user-centered concepts.

Retelling and Reinventing the Mundane

Technology has long been the source of interesting stories. Many of these stories are full of glory and conquest—they are cast in the light of progress as it aims its beam into the dark, infinite beyond. We all are familiar with stories such as those, for instance, of Thomas Edison, the lone genius who worked feverishly night and day to perfect the lightbulb, the phonograph, and even the motion picture camera. We also know well tales of technological achievements such as the story of the American railroad, which was built piece by piece over mountains and through deserts, always moving positively and progressively toward the “West.” This, of course, is the same railroad technology we now describe sentimentally, like an old, trusty pet: the dying iron horse whose day is past and who is doomed to a slow but comfortable death. Such are the tales we tell again and again of technology and its heroes.

But there are other stories to tell of technology, too. Hidden from view, almost imperceptible because they blend so perfectly into the backdrop of daily, mundane experience, are stories that beg to be told of people as they work with, against, and through the technologies that abound in our lives. These silent, hidden stories have been effaced in modern times, however, as the value placed upon the stories of everyday knowledge—of “know-how”—has given way to the “knowledge in the machine,” or the “knowledge in the system.” As Michel de Certeau puts it,

. . . know-how takes on the appearance of an “intuitive” or “reflex” [sic] ability, which is almost invisible and whose status remains unrecognized. The technical optimization of the nineteenth century, by drawing from the reservoir of the “arts” and “crafts” [sic], the models, pretexts or limits of its mechanical inventions, left to everyday practices only a space without means or products of its own; the optimization constitutes that space as a folkloric region or rather as an overly silent land, still without a verbal discourse and henceforth deprived of its *manouvrier* [sic] language as well. (p. 69)

The knowledge of everyday practice has become nearly voiceless: a colonized knowledge ruled by the technology and the “experts” who have developed the technologies. Yet the voices and the knowledge embedded in the stories are still there—they are just more difficult to hear, more difficult to recognize. For de Certeau, *know-how* has become a matter of folklore, of tales often told but not believed to be “real.” Thus, as folklore, the appreciation of *know-how* and of *use* has been lost because the *arts* of *know-how* that were at one time conscious have come to reside in the collective unconscious: not seen, not heard, and not known, a type of knowledge that has been stripped of its ability to consciously voice its purpose, power, and means by which it can make its knowledge visible. Rhetoric, particularly the *arts* of rhetoric, can be used to resurrect this lost form of knowledge and make it visible. In the coming pages of this book, we will consistently turn to the ancient concept of rhetorical arts to uncover, and revalue, the knowledge of know-how and use.

There also is a richness in these tales of the mundane that we too easily overlook: a richness that lifts the everyday experiences that we merely think of as *know-how* or *doing* to another level that transforms the mere *doing* into *living*. At this heightened level, there is a reciprocity among the artifact itself, the knowledge of know-how, and the social milieu that always circumscribes technology, knowledge, and actions. A potent example of this interchange is found in Helen and Scott Nearing’s *The Maple Sugar Book*—a book that in the very best of ways can be termed a treatise on know-how or use. In the conclusion of their book, the Nearings reflect upon their years of learning about, and then actually farming, a self-sufficient maple sugar operation in southern Vermont:

We have earned from maple and found a means of livelihood. We have also learned from maple. The occupation of sugaring has been a thorough-going education and broadened our contacts with life in its many aspects. The young Thoreau in his journal wrote, “Had a dispute with my father about the *use* [sic] of my

making this sugar. . . . He said it took me from my studies. I said I made it my study and felt as if I had been to a university.” A complete syrup and sugar maker comprises in himself a woodcutter, a forester, a botanist, an ecologist, a meteorologist, and [an] agronomist, a chemist, a cook, an economist, and a merchant. Sugaring is an art, an education, and a maintenance. (p. 246)

This paragraph by the Nearings overflows with the diversity that is quietly, silently imprisoned by our modern conception of the mundane as a knowledgeless land. The multiple roles we all play in our everyday actions, in contrast to the overspecialized view we most often have of our lives, speak most pointedly of the lost, colonized voices of know-how. How dare we consider ourselves botanists, economists, mechanics, or electricians! Yet, within our knowledge of the mundane, we often *act* and *do* as specialists, but we are not allowed to claim such knowledge because (in most cases) we were not taught such knowledge in a formal educational environment. Our own knowledge of know-how and use most often lies outside the bounds of school, in a hinterland ruled by the colonial hegemony of “those who know.” We learn of know-how and use *through* practice, *so that the practice defines the theory* of our actions: the actions of know-how and use.

We learn as we do within the context of know-how and use; the actions beget the learning. The reversal of theory *then* practice to practice *then* theory is a table-turning phenomenon unrecognizable by many academic disciplines that instead champion the knowledge of theory over the knowledge of practice (if indeed the knowledge of practice is even recognized in the first place). Such a radical view of knowledge and learning, as that which is derived from practice, is an activity of reinventing not just the esoteric arguments of theory and practice but is a reinvention of the fundamental material makeup of our very educational systems. What would it mean to our educational institutions, the user might ask, if we made the knowledge of know-how visible within the confines of the academy? To paraphrase Aristotle, would the student judge better of the classroom than the teacher? Would the teacher judge better of the classroom (especially the computer classroom) than the architects who designed it?

Recovering the Mundane

As I have attempted to uncover these stories and tales for myself, as part of an effort to understand what it means to be a user of technology, I have from time to time used my own experience as a guide. Not unlike Thoreau or the Nearings, I have reflected upon moments that help me conceptualize what it means to use and to be a user. These personally situated experi-

ences have enabled me to recall some of the lost voice of the user, and for a brief time I would like to indulge you in a few of the tales that follow:

I don't think that I could have been much more than ten or eleven years old, but the memory is nevertheless pungently clear. I was standing on the corner of Fifth and Broadway in Gary, Indiana (the town where I was 'born and bred' as they say), waiting for my father to come out of the building where he had an office. As I waited, I watched a man dressed in a doorman's uniform step from the front door of the First National Bank with a large push broom in his hand. Once out on the sidewalk, he began sweeping and continued to do so until he had whisked a significant amount of white-gray, dusty material out to the curb. He then pushed the dusty residue down the length of the sidewalk, off the curb, into the street, and finally into a storm-sewer grate where it fell quickly out of sight. The doorman returned to the main entrance of the bank, and with the broom still in his hand, held the door for a customer who stepped out onto the temporarily clean sidewalk.

Not long after the workman was done sweeping, my father appeared and we began walking to our car. On the way, I asked my father, "Why was that old man sweeping the sidewalk in front of the bank?" "He does it to keep people from tracking the dirt into the bank," my father replied. "It helps to keep the carpets in the bank from getting dirty so fast." Still not completely satisfied with the answer, I continued, "Why does the bank sidewalk get dirty so fast?" To answer this question, my father stopped, turned, and pointed his finger toward the north—directly at the main "Works" of U.S. Steel that lay a scant five blocks away. "You see the smoke coming from the "Works?" There's a lot of dust and dirt in that smoke, and it falls like rain on the downtown sidewalks every day and night. It's especially thick when water is dumped on the hot steel after it comes out of the blast furnaces. The man at the bank is kept pretty busy keeping that dust out of the bank lobby."

Just then, I saw a large white-gray cloud appear over the "Works," and it was followed by a muffled roar. "There . . . there it is now. They're pouring the water on the hot steel—thousands of gallons of it. There will be plenty more dust for him to sweep soon enough," he said as we turned back in the direction of the car. As we continued down the sidewalk, I noticed that the sky was changing color, to a sort of white-gray.

Several years later (actually, it was more like twenty) I recall standing in a century-old log barn with an elderly man who had once farmed the

surrounding land. He was showing me some nearly antique farm implements that sat illuminated only by dusty rays of sunlight filtering through the boards of what had once been the hay maw. At one point he walked over to a horse-drawn grass cutter that was slightly sunken into the dirt floor. "This was the hardest implement for the horses to pull," he said. "It always took two of them to make it go. As you can see, it's all made of metal. Except, that is, for the wooden bar that sits in front of the blade."

I looked down and saw a wooden shaft, about four feet long, that connected two pieces of metal at the base of the cutter. "That shaft controls the sideways cutting action of the blade. They always had to make it out of wood. Hickory, usually. Sometimes ironwood. I remember how the companies that made the cutters would try to use different kinds of metal, but for some reason the metal shafts would bend, or worse yet, the other parts of the mower would get damaged. The wooden shaft, though, would just break...but even that didn't happen too often. It seems that the moisture content of the grass has something to do with it. The wooden shaft would "give" a little with the different moisture conditions and protect the other parts of the cutter from serious damage."

A few years later still (now I'm showing my age), I was teaching my first day of a writing class in a newly opened computer facility. Personal computers were still new, and the units in this room were even stranger because they were Apple Macintoshes®—all the other labs on campus to this point had either IBM-compatibles or mainframe workstations. So, we were all learning about how these icon-driven gadgets worked. Near the end of class, a student asked me to help her get the floppy disk out of the machine. "On the IBMs," she said "you just push that little button. But on these there isn't one. How do you get it out?" I reached for the mouse that sat next to her computer, and using it to move the little arrow on her computer's screen, I dragged her disk's icon to the trash can icon in the lower right-hand corner. "Oh, no!" she cried out. "Don't do that! I don't want to get rid of the disk, I just want to get the disk out of the machine." I assured her that I wasn't destroying or "trashing" her disk, but that the preferred method of ejecting disks on the Macintosh is to drag the disk icon to the trash. "As silly as it may seem," I said, "this is how you are supposed to do it."

Before she finished packing her backpack, I noticed that she put the disk back into the machine briefly to, I suppose, check that the disk was indeed unharmed. "Well," I thought to myself as she left the room, "we both learned something today about what it means to mix metaphors."

User knowledge is always situated. By that I mean what users know about technology and the experiences they have with it are always located in a certain time and place that changes from minute to minute, day to day, era to era. Hence, the complexity of understanding what users know grows with each new experience or story that we tell or hear. At the same time, however, there are connections and commonalities between these experiences that help thread them into a visible, knowable tapestry. In the first scene, the *user* is difficult to identify, at least as far as most common perceptions of users are concerned. Usually we think of users as being those at the end of the technology development cycle who take a tool, use it to make something, and then go on from there. In this scene, all three participants—the doorman, my father, and myself—are users of different types. Within the limited context of this brief scene, the doorman is, fundamentally, a user of two technologies—the push broom and the door of the bank. My father is a user of the office building and its accompanying technologies. I represent a user of a most ubiquitous technology—the sidewalk.

All three of us, however, are commonly connected through the use of technologies that we hardly notice, or if we do notice, then we do so with little or no reflection. When I spoke with my father, we were using possibly the most fundamental technology of the human experience—language. As unreflective as we may be of language as a technology, it is still a human construct, a human invention that is taught, learned, and used in strategic ways, much as we might use hammers, automobiles, or computers. In addition, all three subjects in this scene are users of the larger, more ominous industrial technology of steel manufacturing. Although we were not directly employed by the steel maker, we nevertheless used the products, the city, and even the economy that had been constructed by the technology of steel.² Operating unreflectively, we were (most often) unconscious users of this greater technology, and we literally or figuratively kept the sidewalks clean in homage to the technological “hand that fed us.”

2. I mean most literally that in the situation of Gary, Indiana, the town and its people were very much “products” of U.S. Steel. The city was named for the superintendent of U.S. Steel in the beginning of the present century. The city of Gary did not even exist until 1906 when U.S. Steel decided to locate a mill there. The town was planned from the very beginning as a “steel town”—with the streets even mapped out years in advance of their construction in expectation of the “boom” that the area could expect. Today, like the American steel industry itself, Gary has declined in economic status to the point where the mills only employ a quarter of its peak employment of the 1960s, and the population of the city has actually declined in the last two decades.

In the old barn, I find myself more reflective of technology, possibly because it was placed into a historical context: a technology that “had been.” In this scenario, technological use is imbued with a certain reverence lacking in the steel town image. That reverence, however, is not one of sentiment for lost arts or knowledge per se. I, of course, found the horse-drawn implements fascinating, in part because they represented a mystery of use that I could no longer capture in the present-day context. In other words, there were no longer any horses on this farm to move the implements, and the machinery took on more the quality of a snapshot or an artist’s still life. Nevertheless, I have been continually fascinated by some technologies that defy theoretical answers. Some technologies are best understood only in the active context of their use. In the case of the horse-drawn grass cutter, the wooden shaft represented practice exercising a sort of victory over theory. No matter how hard the engineers tried to make a theoretically unbreakable shaft from the same material as the rest of the cutter (i.e. metal), they failed because the practice, the use of the machine, always demonstrated the best solution. I believe the old farmer held the same respect for the importance of practice, as he told the story of the wooden shaft with a certain glee in his voice.

Finally, in the computer operator of the third scene, we have a user and a situation of use that is easier to identify (and maybe identify *with*). Ironically, this young woman was using what has become the epitome of “user-friendly” technology—the Apple® Macintosh computer. Based on the familiar metaphor of the modern office, the Macintosh interface attempts to replicate an environment of use that anyone (who knows the essential material items of a modern-day office) can maneuver with ease. For the most part, the success of the Macintosh interface has been great. It does make computers more approachable (and it is easy to see why Microsoft Corporation wants to imitate that interface through its heavily marketed interface for IBM-compatible computers). But there are complexities of some technologies that even the most well conceived metaphors cannot overcome. Situated in the complexity of mundane experience, always constrained by the users’ previous knowledge and the time pressures of everyday moments, technologies are constantly tested and refigured by those who use them. In essence, users understand technology from a unique perspective constructed from knowledge of practice within certain contexts. Yet, as de Certeau and a few others claim, this type of knowledge is subverted beneath a discourse of expertise, and thus has been rendered invisible to the modern eye. We take for granted that which we *do* and unwittingly surrender knowledge and power due to our lack of reflection on our mundane interactions with technology.

In so doing, we also surrender fundamental democratic rights and responsibilities. In a society that is perpetually bombarded with new technologies, it is important to reflect on what it means, in terms of the larger social order, to be a user of technology. I have found no better description of this very point than in the words of Aristotle that begin this chapter and set the tone for much of this book. The quote is taken from the *Politica*, and it is the conclusion of a discussion by Aristotle on the basic human right to take part in the decision-making activity of a culture. In a very practical sense, who has the right to voice an opinion or a vote? Who, Aristotle asks, is the better judge—the one who makes the product or the many who must use it? “Moreover, there are some arts whose products are not judged of solely, or best, by the artists themselves, namely those arts whose products are recognized by those who do not possess the art; for example, the knowledge of the house is not limited to the builder only. . . .” (*Politica*, 1282a 16–19).

The product can be a house, a ship, an automobile, a computer, or a vacuum cleaner, but in a larger sense the product is also the *culture* that we make through the arts and artifacts of technology. Users of a culture, in other words, often *are* the better judges, but if they are silent or invisible then they (we) have little power to affect the decision-making processes. We become passive observers of a social order that has the potential to be, ironically, undemocratic because it is governed by the technology that we have created. In *Critical Theory of Technology*, Andrew Feenberg describes the consequences of this phenomenon of an undemocratic technological order most succinctly.

At the highest level, public life involves choices about what it means to be human. Today these choices are increasingly mediated by technical decisions. What human beings are and will become is decided in the shape of our tools no less than in the action of statesmen and political movements. The design of technology is thus an ontological decision fraught with political consequences. The exclusion of the vast majority from participation in this decision is the underlying cause of many of our problems. (p. 3)

Of course, the answer to this problem of citizen (user) participation and control is no clearer today than it was in Aristotle’s time. In fact, it may have become more complex because the technological issues have become more widespread and powerful. But there is a common ground despite the separation of over twenty centuries, and it is situated, in part, in an understanding of how we, as users of technology, are empowered by virtue of our role as users. In other words, to revalue and refigure technological development and use from a user’s perspective is a radical act, but one that has a

strong historical base. The pages that follow are but a modest step in the direction of such a revaluing and refiguring.

Theorizing the Mundane

The narratives one collects or overhears concerning the everyday world are helpful in uncovering and situating the problem of mundane experience. The tales are interesting, revealing, and, I think, accurate lenses through which you can look at the complex variety that constitutes the ordinary world. But as much as the stories aid us, they fall short of providing a conceptual view of technological use that is fruitful in any systematic way—such as technical communicators might ask for. Consequently, what is called for is a theory: a theory based on user practice as it is associated with technological use. This theory of users and technology also must be cognizant of the social context—the cultural ambiance³—that ultimately situates the user and the technology. For the basis of this theoretical enterprise, we will now turn to the concept of user-centeredness.

What is meant by *user-centered*? The term that constitutes the title of this book has entered our present vocabulary through the context of computer technology, most visibly through the efforts of Donald Norman and Stephen Draper in a collaboration that began over a decade ago.⁴ The exigency of their user-centered project was rooted in the multitude of problems people have when they use computers. In the introduction to their edited collection, *User Centered System Design*, Draper and Norman state that their “. . . book is about the design of computers, but from the user’s point of view. . . . The emphasis is on people, rather than technology, although the powers and limits of contemporary machines are considered in order to know how to take that next step from today’s limited machines toward more user-centered ones” (p. 2). They offer an invitation to those interested in working on the issues of user-centered system design: “We are prepared to take on board any discipline, any approach that helps. It is a pluralistic field. . . .” (p. 2).

3. “Cultural ambiance” is borrowed from the historian of technology John Staudenmaier. According to Staudenmaier, all artifacts are affected by the social sphere, the cultural ambiance, thus making technological artifacts and systems dependent upon, instead of autonomous of, human intervention. See *Technology’s Storytellers*.

4. See their edited collection, *User Centered System Design: New Perspectives on Human–Computer Interaction*, listed in the bibliography.

In this book, I take the project of user-centered design set forth by Norman and Draper as a starting point, but I consider my project, although related, considerably different. For example, I emphasize that the problems associated with technological use are, literally, ancient. Historical context, in other words, is lacking in most user-centered research. The ancient Greeks, from whom I draw a number of concepts regarding technology and use, treated technology as an *art* whose *end* was in the *use* of the product, not in the design or making of the product itself. For example, in Aristotle's previously mentioned definition, the user is contextualized, recognized as residing in a situation of use where a special knowledge—the knowledge that users bring to interactions with technological artifacts—is championed. How often would we consider, in modern times, the user of a house more expert than the builder of the house?

Obviously, the user may know little, if anything, about the construction of the house, yet there is a knowledge—a knowledge of *use*—that is seldom acknowledged in most modern contexts. The specialist who designs or constructs the artifact is almost unquestionably the one who “knows” the artifact in our present day, and computer technology is no exception. The computer is presented as a black box technology that is driven by an expert/novice binary of knower/nonknower. To borrow from a post-World War II colloquialism, the computer in the black box view *is* rocket science in the sense that only a few experts can really understand how it functions. Computer users, thus, are more often viewed as idiots who must have the technologies “dumbed down” to their level, a level that has no knowledge of its own—only that knowledge that is handed down by those who made the object in question. It has only been recently, just the last few years, that those involved in user-centered design have begun to express interest in contextualized and situated interpretations of technology and use. We have much to gain by investigating ancient and indigenous conceptions of technology, most especially in user-centered quarters where such research has been virtually nonexistent. These connections and disjunctions between ancient and modern will be central to the discussions that follow.

Instead of focusing solely on computer technology as most user-centered design has done, I will expand the scope of the user-centered project to technology in general.⁵ This I have done for several reasons. To begin, I first came to user-centered concepts through computer technology, specifically through user documentation. As I completed my dissertation, *Rhetoric*

5. User-centered concepts often have been used to provide analogies from contexts outside computer technology, but the actual applications of user-centered design in most other areas is work that is waiting to be done.

and Use: Toward a Theory of User-Centered Computer Documentation, however, I began to imagine what the implications of user-centered approaches to technology could more generally mean. It appeared to me that although computer design is certainly amenable to user-centered concepts, it was possible that some of the difficulties that users have with other types of technology were being overlooked. The glamour of the computer was possibly diverting the eyes of the beholders away from more plain, but nevertheless widespread, technologies of mundane experience. Thus, I was led to think about user-centered concepts as they might apply to a greater variety of technologies.

Second, the issue of context became more important as I contemplated what it means to be a user of technology. For instance, the complexity of multiple roles that one plays while using technology can be studied in a variety of environments, not just that of the computer. There are virtually an infinite number of domains that contextualize technological use, and the opportunity to investigate those realms was too enticing to ignore.

Third, user-centered research has dedicated itself almost entirely to probing the interactions that humans have with technological artifacts (usually computers), and therefore it is limited to the conception of technology as a material artifact. My interest in technology encompasses the discursive, or nonmaterial, aspects of technology and technological use. In particular, I will pursue the problem of *technique*—a term definitely related to the modern sense of technology but quite different when refigured through ancient concepts.

I also take Draper and Norman's invitation to "come on board" to heart, for there are no technical communicators present in their original collection. As I have already indicated in the Preface, conversations about technology and its cultural/political impact have been widespread. Philosophers, rhetoricians, linguists, computer interface designers, historians, sociologists, and literary scholars have all been part of this conversation (some, of course, more than others). Technical communicators have been on the periphery of these discussions, and our role in the dialogue has not been as visible as it should be. My project is aimed at entering this conversation and playing a part in furthering technical communication's engagement with the important social, ethical, and political arguments that are currently being discussed by other disciplines in relation to technology.

Technical communication already functions interdisciplinarily—this is one of its strongest assets—but interdisciplinary research is a two-edged sword. On the one hand, traversing various disciplines gives us a strong and penetrating perspective. It allows us to build theoretical, historical, and methodological bases in rich and invigorating ways. Like transfusions of essential nutrients, an interdisciplinary focus keeps us refreshed and alive.

It is not surprising, then, that technical communicators have borrowed extensively from a variety of disciplines in order to develop theories, research methods, and even the practical “tools of the trade” that are used in both the workplace and classroom. For instance, we have used theories of problem solving, social interaction, cognitive development, and visual design; we also have borrowed methodologies from ethnographers, linguistics, rhetoricians, and psychologists. We have grown immeasurably as a result of these borrowings.

On the other hand, interdisciplinary work has pitfalls which, although they often can be overcome, nevertheless need to be addressed. The list of these interdisciplinary pitfalls is potentially long, but one is most relevant to the context of this book: the problem of becoming so dependent on the borrower that we fail to reciprocate back into the interdisciplinary milieu with any contributions of our own. To be blunt, technical communication has not managed to give much in return, or maybe I should say that we have not been influential in having our voices heard across the terrain of the disciplinary divides. Maybe this is because of the “infancy” of our field; we have not established our identity strongly enough to be credible in the sense of academic disciplinaryity. Technical communication may not even be established enough to call itself a discipline. Rhetoric and composition, for instance, was merely a service-oriented subfield of English studies until researchers established a theoretical and historical base for that emerging discipline. Technical communication may have a way to go before it can have the confidence brought about by disciplinary identity.

At the very least, our inability to reciprocate might be due to our ongoing interest in practical solutions to problems that technical communicators face on a daily basis: solutions that are not easily valued by some disciplines that consider themselves more theoretically or historically grounded. Engineers, for instance, perceived as mere practical artisans in the nineteenth century, sought the approval of the more respected theoretical “scientific” disciplines through borrowing scientific methods and developing measurable professional standards as avenues to disciplinary viability.⁶ Whatever the reason for our reluctance to engage in these discussions, we should be more involved in a formative, interactive dialogue with these other disciplines—for us and for them. After all, we have plenty to offer.

In the chapters that follow, I present a modest offering to this interdisciplinary dialogue through an elaboration of user-centered technology in a

6. For more on the professionalization of engineers, see Edwin Layton’s *The Revolt of the Engineers*.

variety of contexts. To ground this discussion, the next chapter will present a rhetorical framework of user-centered technology: a framework that imagines users as a viable part of technology design, development, dissemination, and use.