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Wired & dangerous: hacks, hair extensions and other twists on traditional technical communication

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IWIRED & DANGEROUS: HACKS, HAIR EXTENSIONS AND OTHER TWISTS ON TRADITIONAL TECHNICAL COMMUNICATION

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DEDICATION

FOR MY HUSBAND, AUSTIN

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CHAPTER 1

Ever since its inception as a "humanistic" research discipline (Miller, 1979; Dombrowski, 1994), technical communication has striven to balance workplace exigencies with attention to the broader rhetorical, social and ethical issues within which technical communication is situated. Recently, this humanistic agenda has expanded from a simple awareness of contextual factors surrounding work (see, for example, Collier and Toomey, 1997) to calls for technical communication research in non-workplace and other non-traditional sites. Frequently these calls for "extra-institutional" research (Kimball, 2007) are driven by the assumption that users' indigenous technical communication is inherently more user-centered – and therefore more democratic – than the more traditional technical documentation underwritten by corporations (see, for]nnexample, Johnson, 1999; Kimball, 2007).

This dissertation articulates and challenges our field's assumptions about the revolutionary nature of extra-institutional documentation. Drawing on Aristotle's broad classification of 'habits of mind' or modes of inquiry outlined in the Nicomachean Ethics, as well as Johnson's user-centered theory, this dissertation examines 2 extra-institutional sites in which users generate and organize their own technical documentation: Hackaday.org, a hacker database consisting of an intertextual network of hacks (which are short step-by-step instructions for hacking), and Black Hair Media, a virtual DIY hair extension community with an explicitly Afro Centric twist. Retaining characteristics of traditional proprietary technical communication and the "malleable, animated and visually complex" forms of communication associated with virtual communities (Bolter, 1991, p. 26), these two extra-institutional sites illuminate ways that

knowledge and power are negotiated in digital spaces that lack a centralized regulatory power.

This chapter begins by charting the "identity crisis" that is shaping technical communication in the 21th century, and out of which the calls for extra-institutional research emerged. These calls for extra-institutional research motivate my project. Next, I trace the history of an important question within this identity crisis: What role should *users* play in shaping technical communication? This question examines the ideal role of the user in traditional technical communication, an ideal that some scholars extend to research in extra-institutional sites (see, for example, Kimball, 2006). The chapter concludes with a project description, methodology overview and outline of chapters.

Defining the Field of Technical Communication: Evolving Concepts, Emerging Questions

This surge of interest in new, non-traditional sites is one outcome of a recent move away from narrowly defining the scope of technical communication (Allen, 1990) and toward an open-ended definition of the field (Allen, 1990). Recent research in technical communication suggests that the field is currently experiencing an "identity crisis" similar to the period of intensive self-scrutiny recently experienced by Composition Studies in the late 1980s and early 1990s (Mirel and Spilka, 2002, p. 4). At the heart of this identity crisis is the relationship between technical communication, which had its origin in engineering departments at the turn of the 20th century, and the industrial setting in which most technical communication is traditionally assumed to take place. To what extent should technical communication

research be responsive to the needs of industry and, alternately, how can technical communication research and practice maintain the critical distance from the engineering industry and its organizational culture that was hard-won in the 1970s? While different researchers characterize these conflicting tensions as "productive" (Bernhardt, 2002; see also Miller, 1989) or dysfunctional (Bosley, 2002; Dicks, 2002), there is widespread agreement that the relationship between technical communication and industry will shape the future research agenda for the field (Dombrowski, 1994; Duin and Hansen, 1996; Mirel and Spilka, 2002). Despite our constant efforts to redefine this relationship (see, for example, Allen, 1990), our understanding of the academic-industry relationship has primarily focused on achieving social responsibility and critical distance within industrial workplace settings, without accounting for the complex shaping of technology outside of industry.

The Evolving Relationship of Technical Communication to Industry:

From Support Model to "Humanistic" Critique

Defining our relationship to industry has been a key issue for the field since the inception of technical writing courses within the engineering departments of the agricultural and mechanical (A&M) colleges that were founded by the Morrill Act (1862) in the late 19th century. However, the relationship between technical communication and industry has not always been problematic. Some theoretical work in technical communication attempts to trace the ancient history of the field to concepts from classical rhetoric such as Aristotelian *praxis* or conduct (Miller, 1989); however, most scholars trace the origins of the current discipline to the simple

problem of preparing engineering students to write documentation for the increasingly complex industrial workplace at the turn of the 20th century (Russell, 1991; Adams, 1993; Kynell, 1996). The technical communication teachers responsible for preparing these students to write on the job were often Literature PhDs hired by engineering departments to teach course listings such as "English for Engineers" (Connors). Marginalized from both Literature and Engineering, these early technical writing teachers struggled for respectability by adopting a "support" or "service" model with one simple objective: demonstrate to students that mastery of the principles of written composition can be "useful" to aspiring engineers (Harabager, 1938, p. 157; Anderson, par. 14)). Extant textbooks from this period show that technical communication adopted engineering's positivist philosophy of language, which emphasizes "objectivity" and efficiency and de-emphasizes the role of rhetoric in shaping science (Miller, 612-614). Therefore, in this early period dominated by the support or service model, technical communication adopted the philosophical orientation of engineering, and industrial applicability dictated the *raison d' etre* of the field.

However, this vision of selfless service to industry declined in popularity after World War II. The wartime demand for technical documentation to support new machines (Connors), followed by a surge of matriculation into engineering programs under the GI bill, led to both a surge of interest in technical communication and rapid expansion of engineering departments (Kynell, p. 104). Burgeoning postwar technical communication programs rapidly outgrew the now overcrowded, understaffed engineering departments and moved to the English departments within

which technical communication is now most often housed (Connors, p. 178-188). This geographic move away from engineering presaged an era of professional and philosophical independence from engineering and the preoccupation with the forms of objectivity and efficiency valued by the postwar industrial workplace

Also, programs such as literary studies and rhetoric and composition studies (which were also housed in postwar English departments) pressured technical communication to redefine its relationship to industry. Once an asset, the industry-focused pragmatism of technical communication now proved to be a liability as the field struggled to position itself within the milieu of English Studies during the zenith of formalism and the rise of structuralism, two movements within the humanities that viewed texts (and entire disciplines) as manifestations of acontextual and ultimately self-contained systems (Sassure, 1916; Levi-Strauss, 1962; Culler, 1976). During this period, some apologists for technical communication attempted to align with literary studies by using literature to teach technical writing principles (Hagge), or find a place for technical communication within the fledgling composition programs (Power, 1961). However, despite these brief attempts to operate under the aegis of other disciplines such as composition or literature, most histories of technical communication celebrate a surge of professionalism and disciplinary independence in the postwar era. Removed from Engineering and forced to compete with both literary studies and composition for departmental resources and recognition, technical communication attempted for the first time to carve out a distinct research space and gain status as an independent research field supporting a growing

profession of technical communicators in an age of increasing technological sophistication (Connors, p. 185-188).

Ultimately, the challenge of developing a research discipline focused on technological documentation within the humanities–oriented English Studies sparked a "humanistic" (Miller, 1979) approach to the research and practice of technical communication that remains the dominant theoretical framework in technical communication today. Although Miller's seminal essay refrains from defining humanism (and subsequent technical communication scholars have adopted her rather loose articulation of this term), the humanistic approach is broadly an approach to technical communication that is informed by constructivism, the philosophical movement that stresses the role of rhetoric in shaping human knowledge. (especially scientific knowledge) (see, for example, Overman-Smith, 1997, p. 193). Grounded in the widespread, interdisciplinary revival of rhetoric associated with poststructuralism in the 1960s and 1970s (Perelman, 1969; Burke, 1969; Barthes; Toulmin) this humanistic (constructivist) approach to technical communication turned away from the field's traditional positivist focus on precise representations of technical data to focus more broadly on technical writing as an act of participation in a scientific community – a *rhetorical* act of participation laden with ethical (Ornatowski, 1992; Katz, 1992); political (Longo, 2000; Kynell, 2000); and theoretical (Dobrin, 1989) implications. Philosophically divorced from the positivist underpinnings of science and engineering, technical communication was now poised to develop research methods for exploring the efficacy of existing industrial practices and to develop new practices grounded in an informed "humanistic" critique of industrial technical communication. Postwar technical

communication was moving from the support model to "disciplinary maturity" (Kynell, p. 103).

Humanistic aftermath: Ancient Conflicts, New Tensions and Tentative Rapprochement

Certainly the humanistic approach, which was grounded in a critique of positivist science and emphasized rhetoric and ethics, envisioned a radically different role for technical communication than the support role allocated to the field by engineering departments and the industrial practices they served. Early scholars predicted that this conflict of values would ultimately prove productive, with the academic discipline of technical communication occupying a critical stance toward technical communication practices in industry (Miller). Drawing on the Aristotelian concept of praxis, Miller argues that technical communication scholars should not merely develop theories and pedagogies that "replicate existing practices" but also engage with industry to evaluate, critique and ultimately transform those practices for the benefit of the wider human community beyond the corporation (23). This critical stance toward industry remains the dominant approach in current technical communication research and is echoed by concepts such as Bernhardt's *active-practice,* which connotes academic-industry partnerships forged in a spirit of mutual critique (Bernhardt, 2001). Instead of reconciling academia and industry to a shared vision, these researchers reason, humanistic critique of industry will generate a "productive tension" with the potential to transform industry, invigorate academic research and provide invaluable learning opportunities to students via academia-industry partnerships (88-90).

However, scholars such as Bernhardt also warn that the conflict of values between the academic discipline of technical communication and industrial practices

has the potential to create more barriers than opportunities for technical communication research and industry. These barriers have given rise to a new generation of critiques, which focus less on the "tension" between academia and industry and more on building a tentative rapprochement between these sometimes radically differing philosophies, with an eye toward building new and productive academic-industry partnerships. For example, the predominant humanistic approach places rhetoric at the center of technological development, according the technical communicator an important role in the workplace.   However, research has suggested that technical communication practitioners continue to occupy a marginalized status or "servant role" in the workplace as contractors and clerical staff (Davis, 2001, qtd. in Spilka, p. 100); similarly, their work is viewed as an "afterthought" to technological development (Johnson-Eilola, 1996, p. 248; see also Horton; Doheny-Farina; Sullivan; Weiss, "Usability"). In addition to holding differing viewpoints on the role of technical communication in shaping technological development, technical communication theory and industrial communication practice also accord a differing status to the wider community. While the predominant humanistic approach views technical communication as serving the wider human community or the "interests of society" (Dicks 21), practitioners in industry are encouraged to identify primarily with the company and serve the company's objectives (Dicks). Taken together, these core discrepancies in conceptualizing both the practice of technical communication and the community context have created huge "cultural impediments" to pursuing the field's long standing goals such as collaborative research and campus-industry partnerships that would provide internship opportunities for students (Bosley).   Academia and industry have often appeared to hold radically

incompatible visions for technical communication, and the task of "bringing [these] communities together" is often identified as a key goal for future technical communication research (Mirel and Spilka, xii).

Furthermore, on a theoretical level, these differing visions have not only hindered academic-industry partnerships; they have also caused technical communication research to stagnate in a mode of critique. Blakeslee (2002) effectively summarizes the focus of empirical research in technical communication research as "emphasizing differences" between academic theory and corporate realities; the research findings presented by these studies tend to contrast "a relatively disappointing current reality with idealistic scenarios of the future" (p. 100). Not surprisingly, technical communication scholars have started to complain that our research has depressingly "little influence" on the practice of technical communication in industry (Spilka, 2002, p. 97). Over the 30 years that have elapsed since Miller's seminal essay, humanistic (constructivist) technical communication has developed primarily as a mode of critique; this approach in itself offers no collective vision for the future of technical communication research (Spilka, 2002) and no exemplars of humanistic technical communication. Clearly, the radical differences between academic theory and workplace practices have led to a critical deadlock, hindering our ability to envision a viable future in which technical writing research addresses and has the potential to transform workplace practices.

The Role of Users in Technical Communication

The lengthy history of the academia-industry relationship provided here outlines a shift in technical communication scholarship, which originally existed to merely teach

industry practices, but gradually positioned itself as a critic of these practices. Arguably, the current critical distance between technical communication and industry creates the space for projects such as mine to examine extra-institutional sites.

In terms of this project, the most significant shift in the recent history of technical communication is the move toward *user-centered* theories and practices (Johnson). Throughout the 20th century, the emerging academic discipline of technical communication drew on diverse fields ranging from philosophy and critical theory (Mitcham; Winner), critical and cultural studies (Feenberg), sociology (Wacjman) and feminist theory (Bosley, 1995). However, all these disparate fields that have contributed theories to technical communication share a common, central question: "What is the relationship between humans and technology?" (Johnson, p. xi). The answer to this question depends largely on how each theory characterizes the human, or *user* – as passive, controllable, teachable, in need of protection or, ultimately, as empowered. .

As technological societies evolve and industrialize, technical communication has accorded varying degrees of attention and status to the human user. Although not acknowledging the rhetorical dimension of technology as Johnson does, preindustrial technical communication was arguably closer to the user-centered ideal than technical communication in the rapidly industrializing 20th century. Prior to industrialization, technical communication was primarily oral or "prediscursive" (Johnson, 2006, p. 171) and characterized by a general "absence of books" (Gordon, 1996. qtd in Johnson, p. 174), with ledgers and other written records (often in shorthand) playing only a peripheral role in human-technology interactions. Perhaps because written

documentation was informal, limited and "fragmentary", engineers and toolmakers viewed technical knowledge as "resid(ing) in the worker" and not in written texts (p. 175). Therefore, extant written texts from this period (such as Erskine's (1770) letters on ironmaking) are strongly oriented toward "the workmen" as collaborators in shaping technical knowledge and the primary audience of oral and written technical communication (p. 176). Furthermore, studies of extant written records of preindustrial technical communication have discovered that these texts are centered around the "oral and physical world" of the worker, with frequent use of narrative, anecdotes and analogies that explicitly relate technological processes to the workers' everyday experiences. Although preindustrial technical communication may not have been self-consciously rhetorical – studies at least suggest a de-emphasis on *written* texts and "only minimal verbalized explanation" (Ong, 1982, p. 43; qtd in Johnson, p. 172) – this de-emphasis on writing appears to correlate with a strong orientation toward users as the locus of technical knowledge and the primary audience of technical communication.

However, the move toward industrialization in the late-19th and early 20th centuries brought both a proliferation of written forms of technical documentation and a shift from the pre-industrial emphasis on the user / worker to a more "impersonal "focus on machines and parts (Johnson, p. 179). Technical communication began looking to the scientific method, rather than to workers' experiences, as the principal source of knowledge about human-technology interactions. For example, the new field of human factors research applied the scientific method to human-technology interactions to extrapolate principles for "scientific management" of industrial engineering at the turn of the century. Throughout the first half of the 20th century, "scientific" systems such as

Taylorism, which aimed to calibrate each step of human-machine interactions to maximize efficient production, rose to become the dominant approach to management and gradually extended into nonindustrial workplaces such as sales departments (see, for example, Brown, 1914 on the scientific management of sales). As Johnson notes, these scientific (or Taylorist) approaches had profound philosophical implications, subordinating humans to machines with the ultimate goal of "engineer(ing) the human into the system" (p. 75). Displaced by science from the center of technological knowledge, users had become an object of the expansive program of technological regulation in the industrial workplace.

Scientific management remained the dominant trend in management theory up until World War II, and ultimately impacted technical communication in three significant ways. First, attempts to apply the scientific method to every aspect of production gradually reached technical documentation practices and pedagogy. During this period, some early empirical studies investigated workplace communication (see, for example, Simon, 1947) and technical writing textbooks increasingly employed "the language of the scientific process"(Kynell and Moran, 1999) to illustrate principles of technical communication. Second, while contemporaneous with the rise of scientific management, this use of scientific rhetoric to justify technical communication practices was also involved in another salient problem of the early industrial workplace: the professionalization of Engineering, which had been associated with "skilled mechanic-work" prior to industrialization (Engineering in Society, p. 18). Engineers pursued this goal of professionalization via college programs that grew "progressively more scientific in content" (p. 18). These college level programs of study required not only scientific

knowledge but also advanced communication skills, a textbook authors urged engineering students to recognize the link between "professional prestige and English" (Harbarger. Finally, these related moves toward scientific technical communication and the professionalization of engineering succeeded at the expense of a previously crucial and prestigious element of technical communication: the user. Bemoaning the "wretched" state of engineering writing in the early 20th century, the Society of Petroleum Engineers called for improved technical communication instruction to help engineers impart "the complexities" of technical knowledge to a "less than sophisticated" audience (Kynell, 2000, p. 5). Ultimately, technical communicators assumed that technologies placed mainly physical demands on workers and that these demands could be mitigated by scientific programs and worker compliance. By the 1940s, users had transformed from experts to "idiots" -- and would remain so for most of the 20th century (Johnson, p.43-69).

The Rise of Human Factors

However, this bleak view of users – as an unsophisticated and fallible component of technological systems – was mitigated by World War II, a "truly technological" war that spurred rapid developments in technology and communication. These "frightening and complex" new wartime technologies introduced new hazards (such as nuclear radiation) and potentially global consequences of error. Engineers and human factors researchers began to acknowledge the "cognitive demands" placed by these technologies on users (who were mainly Allied soldiers). These cognitive demands on the user's memory, attention and judgment were compounded by military demands of both secrecy (the user must avoid being seen by enemy forces) and intelligence (users

must be trained to notice salient details about enemy technologies), as well as the stress of impending death. These increasing cognitive demands brought two modest changes in the status of users. First, from the perspective of the human factors research that influenced wartime technology, users were conceptualized as possessing a cognitive (and not merely physical) dimension) that engaged the technology; therefore, technological use was arguably a form of cognitive or intellectual work (Longo, p. 129). Second, because wartime technologies posed new cognitive demands, users were now entitled to the "lucid explication of technology" under training programs that they aspired to continuous improvement under the emerging field of instructional systems design (Longo). Comprising written documentation and hands-on instructional programs, these new systems differed from prewar technical communication in that they assumed a relatively sophisticated user, both providing historical and theoretical context (Longo) and some affordances for the context of use.

Certainly, technical communicators during this period were "in great demand" (Connors, p. 184). However, much like the previous generation of technical communication, these programs ultimately aimed toward standardization of human behavior and "efficiency" of use (Longo and Carliner, p.4). Users during World War II gained a cognitive dimension, but the purpose of user cognition was to comply (usually with military orders) – and not to improvise or innovate. Occupying a midpoint on the continuum from experts to idiots, users served in World War II as foot soldiers of Western political and technological power.

Arguably, the way that technical communication conceptualizes users has been most influenced by the field of human factors, which Johnson defines as the study of

human-technology interactions and the application of these findings to improve "the quality of those interactions" (p. 74). Beginning in the late 19th and early 20th century and rising to prominence during World War II, human factors attempted to alleviate problems associated with the "over-specialization" of the industrialized workplace such as boredom, repetitive stress injuries and human error (p. 74). One critique of human factors from the perspective of technical communication is that human factors reduces the user to a component of the industrial workplace (human factors focuses on users at work); the user's perspective is valuable only in as much as it helps industrial engineers achieve "system efficiency for economic ends" (xvi). Although the perspective of human factors broadened to nonindustrial or "socially situated" contexts with the advent of human-computer interaction research in the 1970s and 1980s, even the most liberal participatory design studies focus on users in the narrow context of discrete workplace tasks (Bodker, 1979). This reductive perspective views users within the limited workplace context of tasks and actions necessary to efficiently perform a "job" (Johnson, p. 75).

<u>Rhetoric Rescues Users</u>

One important consequence of the postwar move to English departments was that technical communication scholars began looking to rhetoric – rather than engineering or human factors– to illuminate key issues for the field.   Initially, this move to "rhetoricalize" technical communication was motivated by a desire to enhance the status of technical writing (the field focused primarily on writing at the time) within English departments. For example, Miller's (1979) oft-cited seminal article draws on the philosophy of constructivism to poses a "humanistic rationale" for technical writing as a

rhetorical and creative (rather than merely logic-driven) enterprise.   Taking as a starting point the constructivist axioms that scientific facts are "human constructions" developed through the rhetoric of science, Miller points out that technical writing is a form of rhetoric that plays a central role in shaping science and technology (p. 5). Therefore, technical writing potssesses social and "humanistic" value, not merely as a set of mechanical skills, but as the rhetoric that constitutes and shapes the scientific community.

Miller further clarifies the nature of this technical rhetoric in a subsequent publication, "What's Practical About Technical Communication?" (Miller, 1989).   Citing Bernstein's distinction between two meanings of the term "practical" – the low sense concerned with "mundane" activities and the high (or Aristotelian) sense concerning activities that "maintain the life of the community", Miller shows that the low sense of "practical" has dominated conceptualizations of technical communication. Arguing that technical communication is – and should strive to be – practical in the higherst sense, Miller defines technical rhetoric as *praxis* or practice. This conceptualization of rhetoric "emphasizes action over knowledge or production"; for Miller, technical writing is therefore "a form of conduct" (p. 22). By associating rhetoric with Aristotelian praxis (and with phronesis, the prudential reasoning that guides *praxis*), Miller provides technical communication scholars with a "locus for questioning" existing practices and a rationale for transforming dysfunctional practices that negatively impact community life. For Miller, technical communication does not happen in a hermetically sealed organizational context but with reference to the well-being of the community as a whole.

Although Miller's rhetorical framework for technical communication as *praxis* does not explicitly address the role or status of *users*, one significant difference that distinguished the rhetorical approach to technical communication from human factors is the emphasis on the user as a member of a community. This reductive perspective views users within the limited workplace context of tasks and actions necessary to efficiently perform a "job" (Johnson, p. 75).

In comparison with human factors, the rhetorical (i.e., constructivist or "humanistic") approach to TC introduced by Miller (see also Katz; Dombrowski; one more name) offers a radically contextual view of the user. More specifically, Miller's rhetorical theory adds a new dimension to the user in context: the user-as-community member. For Miller et al, this enhanced contextual view of the user has two significant implications for technical communication. The first is attention to the impact of community relationships on the way readers/users assimilate technical information. For example Miller, delineating her rhetorical approach to audience analysis in technical communication, advocates a shift away from categorizing users (or in Miller's terms, the "audience" of technical writing) into cognitive or skill "levels" and toward an "analysis … of the writer-reader relationship" (p. 615). This writer-reader relationship is just one component of the diverse local, disciplinary and workplace communities– that are shaped by technology and shape technological use. According to Miller's framework of rhetoric as *praxis,* then, the ultimate aim of technical communication is the wellbeing of the communit(ies) involved in technological use. Good (or "prudent") technical communication practices are those that not only support discrete workplace tasks but "maintain the life of the community"; dysfunctional practices are those that harm the

community as a whole or impede community relationships (p. 15).   Although in subtle ways, Miller's theories transformed the role of the user in technical communication.

Extensions and Critiques of Carolyn Miller's Theory

Since 1979, Miller's rhetorical framework has undergone numerous extensions and modifications. In particular, "Humanistic Rationale" was "significant(ly)" influential across TC journals between 1979 and 1995 (Overman Smith, p. 193) – so influential, in fact, that the pattern of citations of this article in technical communication journals has itself been the object of meta-analysis. According to Overman-Smith, Miller's ideas have proven foundational to 3 main threads in technical communication scholarship. First and perhaps most significantly, technical communication scholars have explored the pedagogical implications of Miller's ideas – particularly during the late 1980s and 1990s, when the discipline focused on "heightening students' rhetorical awareness" (Overmann Smith, p.) to develop a pedagogy that is responsive to the rhetorical approach of social constructivism (see, for example, Allen; Anderson; Brockmann; Lay; I'll want specific citations for these.   The second thread focuses on the controversial role of rhetoric in technical communication and the use of rhetorical theory as an analytical tool (Allen; Barton and Barton; Katz; Schriver); some of this work extends or modulates Miller's critique of positivism by critiquing the "naïve positivism" vs. "rhetorical relativism" binary (Overman Smith, p. 209) . Finally the third thread deals with the role of knowledge communities in technical communication (Blyler; Dombrowski; Gurak; Markel; Sauer; Spilka; Winsor; Zappen),   including detailed and sometimes "quasi-ethnographic" accounts of how communities construct knowledge.   (p. 211). Although

some of these studies critique or modulate Miller's ideas (for example, the positivism vs. relativism binary (p. 209) , most of these Miller citations agree with "the adoption of her knowledge claims" (p. 195)

However, Miller's ideas have been subject to important critiques, most of them focusing on the role of rhetoric in technical communication and the "naïve positivism" vs "rhetorical relativism" binary that Miller appears to posit. Perhaps the most significant critique is Moore's (1996) commentary on attempts by Miller, Dobrin and Ritter (etc) to infuse humanistic value into technical communication via rhetoric (p. 100). Moore argues that these scholars and others ultimately "emphasize the literary and creative" aspects of technical communication in order to "make it more palatable to themselves" and colleagues in literary and cultural studies (p. 101). For Moore, Miller's theories represent an attempt to enhance the political status of technical communication programs and have nothing to do with the nature of technical communication itself.

Moore's critique of Miller represents a subtle— attack on the expertise accorded to users by Miller. Drawing on Toulmin, Moore argues that technical communication must recognize the existence – and importance – of an arhetorical or "instrumental" form of technical discourse including public records, manuals and invoices (Moore). Although Moore does not claim this instrumental discourse is purely "objective", the point of Moore's critique is that the primary function of instrumental discourse is to limit or constrain interpretations. In other words, instrumental discourse uses language to "get things done" and achieve "closure" – not to persuade or foster deliberation (p. 115). We need only to recall that the reader/ interpreter of technical documents is the user and Moore's similarity to the wartime human factors researchers becomes clear: users

are to "get things done", not engage in critique or deliberation. However, Moore argues that these arhetorical forms of writing still possess humanistic value because they attempt to "save lives, minimize pain" and "minimize the socially destructive actions of dysfunctional people" (p.2). For Moore, the humanistic purpose of technical communication is to limit and offset the destructive potential of renegade users.

Turning Point: Johnson's User-Centered Theory

However, perhaps the most interesting critique of technical communication emerged in the 1990s in the form of a question: does technical communication need industry at all? The early 1990s proved to be an intense period of self-reflection for technical communication, brought on by a surge of new histories of the field (Russell, 199s1; Adams, 1993; Kynell, 1996). Now acutely aware of the apparent conflict between the predominant "humanistic" approach to technical communication and industrial practices – and the roots of this deadlock in the history of the field—scholars began to question why technical communication research had been conducted almost exclusively in industrial workplace sites. The exclusive emphasis on the industrial workplace in technical communication became a focus of critique, with calls for research into nonindustrial forms of technical communication such as cookbooks (Allen, 1990). In particular, four researchers proposed the examination of new, non- industrial sites: Tebeaux' (1997) historical research analyzes women's domestic technical writing in the English renaissance, with a focus on the professional status of midwifery; Kynell and Savage (2003) call for an examination of technical writing in "alternative" workplaces such as contractor-client relationships and home offices (p.4); and Kimball (2006), who ventures furthest from the workplace context, calls for research of extra-institutional

documentation in "dangerous" cases such as computer hacking, fraud, and terrorism manuals (p. 84). For the first time, scholars envisioned technical communication as an academic field that operates independently from – and is only loosely tied to – industry. However, with the exceptions of Tebeaux (1999) and Kimball (2006), both of whom rely primarily on analysis of archival documents rather than investigating contemporary practices, these calls for nonindustrial technical communication research have remained largely unanswered by empirical research**.**

However, one prominent thread of research indirectly explores nonindustrial sites by examining how one social group shapes technology outside of industry: end users. Johnson's user-centered technology addresses the multidisciplinary philosophical problem, "What is the relationship between humans and technology?" (xi), from the perspective of technical communication. Citing the breadth of multidisciplinary contributions to this central question from diverse fields ranging from politics and political theory (Mitcham; Winner) to critical and cultural studies (Feenberg), sociology (Wacjman) and history (p. xi-xii), Johnson begins *User-Centered Technology* by asking, "where are the technical communicators in this important field of study?" (Johnson, p. xiii). The silence of technical communicators in multidisciplinary conversations that theorize the human-technology relationship is particularly surprising because technical discourse, as the subject of our field, –plays a central role in mediating relationships between technology and humans. As Johnson notes, technical communication has paid some "attention" to the human-technology relationship, but this attention has been confined to limited and insular (not cross-disciplinary) discussions of specific issues pertaining to technical communication pedagogy (p. xiii). For Johnson, technical

communication's failure to contribute to relevant theoretical conversations on the human-technology relationship is symptomatic of a larger problem: the field's general failure to "reciprocate back into the interdisciplinary milieu" – and especially the field's lack of *theoretical* multidisciplinary contributions (p.15). Johnson's *User-Centered Technology* therefore comprises a theoretical contribution from technical communication to the multidisciplinary field that studies human-technology relationships.

The core of Johnson's user-centered theory stems from critiques of traditional technical communication practices employing a "system centered model" (p. 25) that privileges the designer's view of a given technology above the more "hidden" (p. 36) domain of unofficial "user knowledge" (p. 46). Drawing on these "critiques of technology from a user's perspective" (p. xv), Johnson advocates a user-centered rhetoric that places the audience (i.e. users) at the center of technical communication, not the designer, the technical writer or the technological artifact. Johnson's user-centered theory of technology is therefore an ideal framework for researching technical communication in nonindustrial sites, where users (re)shape technology at some distance from the designer's industrial locus of control. More specifically, Johnson proposes that technical communication is uniquely positioned to reclaim *user knowledge* and accord users expert status equivalent to, or even above, that of the designer. As experts on technological use as it plays out in the "mundane" or everyday world (p. 3), users perform as competent practitioners who adapt technologies to real-world human activities and ultimately shape technological systems (p. 46). However, technological development consistently fails to take users' expertise into account. The design of technology (and documentation) is unfortunately dominated by the designer's

rigid "system view", not the user's, with few or no built-in affordances allowing users to (re)shape the technology in the context of use (see, for example, Johnson p. 100 on the move toward strict controls restraining farmers from locally modifying corporate strains of hybrid corn seed). Instead, traditional designers (and the technical writers who work for them) relegate user knowledge to the un-prestigious "land of the mundane" (p. 6). Johnson suggests that users must therefore resort to what classical rhetoric refers to as *metis,* or cunning intelligence, to exploit loopholes in the (top-down) technological design and adapt technology to the local context (p. 57). In summary, Johnson's user-centered theory of technology advocates design and documentation practices that respect users as experts and empower (rather than prohibit) users to adapt technology to human purposes, thus allowing a framework for exploring technological development in nonindustrial sites such as within the users's "mundane" or everyday lifeworld.

Taking Johnson's user-centered theory of technology as a starting point, this dissertation begins by exploring   the technical documentation of one group of users that is actively involved in reclaiming technologies from the designer's proprietary control: hackers. Contrary to popular misconceptions that the term 'hacker' refers only to computer criminals, hackers are members of diverse online communities involved in "exploring the details of programmable systems and how to stretch their capabilities, as opposed to most users, who prefer to learn only the minimum necessary" (Jargon File, "hacker").   These hacker communities involve primarily legal (but unsanctioned) modifications and can center on diverse technologies ranging from software and computers to artificial intelligence bots and hair extensions.   Employing cunning intelligence and using "mundane" materials such as toasters and washing machines

(Hack A Day, 2009, see "SNES toaster" and "twittering washing machine"), crazy glue, spray-on pantyhose and microwaves (LF forum) , hackers exploit affordances and loopholes in the design of proprietary technologies to adapt these technologies to local tasks and contexts. Furthermore, contrary to the popular stereotype of hackers as pathological loners who execute their work in isolation (Thomas), hacking is a social activity that is grounded in an online hacker culture that celebrates "shared experiences, shared roots, and shared values" (Jargon File 1.1). Hacking always involves membership in "global communities" of users hacking similar technologies and working on similar problems; these are *always* virtual communities constituted by hypertext and digital media (The Jargon File v. 4.4.7, "Hacker Slang and Hacker Culture"; see also Thomas). I later expand my focus to include extra-institutional technology sites that do not explicitly adopt a "hacker" identity.

Johnson's user-centered theory ultimately served as a galvanizing force, establishing users as a central focus for technical communication scholarship and unifying incipient efforts to study these users from the perspective of usability, cognitive theory. A pivotal moment for this interest in users was the publication of two favorable reviews of *User-Centered Technology* in key technical communication journals (Selber, 1999; Sullivan, 2000). Both of these reviews not only praised Johnson's "noteworthy" response to calls for more theoretical research in technical communication but also used *User-Centered Technology* as a springboard to define the "new, expanded and socially responsible role" of technical communication as "the role of the users' advocate" (Sullivan, p. 98-99). This proposed role of user advocacy, the reviewers noticed, potentially addresses the problem of technical communication's marginalization by

"repositioning" the field as "central to technological development" (Sullivan, p. 99; Sullivan notes that this "repositioning" currently exists only on a theoretical level as practitioners continue to occupy a low or marginalized status in the workplace). This strong endorsement from two prominent technical communication scholars heightened the visibility of Johnson's book as well as larger questions about the users' role, and the era of the user began.

In general, the short time span from 1999-2000 was marked by surge of interest in researching users and user knowledge. For example, of the 242 articles about users that have appeared in TCQ and JBTC since the inception of these journals, 196 of these articles appeared after the publication of User-Centered Technology in 1999. Furthermore, the emphasis of user research shifted from assessment of the user's "ability" or skill level (Caernarvan-Smith, 1987), which often assumes that users who experience problems with technology are inherently deficient in knowledge or skills, to themes such as "The Triumph of the User" (2000) which emphasizes users' knowledge and goals. In addition to this heightened interest in users and a trend toward user-centeredness in this research, the term *user-centered* itself gained acceptance and was widely adopted as a touchstone for evaluating technology and technical documentation (See, for example, Rude, 2009, p. 4). Due in part to concurrent discussions on the status of technical communication as a research discipline, user-centered theory was also incorporated into conversations about the shared values, goals and future direction of research in technical communication (see, for example, Rude 2009, p. 4). Once oriented exclusively to engineers and designers, and then to the political demands of English departments, technical communication is evolving to accommodate users.

Project Description

This dissertation in technical communication will investigate the role of users in shaping technology within 2 extra-institutional sites: hackaday.com which is a traditional (and predominately white, predominately male) computer hacker network, and the Lace Fronts forum of Blackhairmedia.com, an Afrocentric hair care site with racially diverse membership. Although a small number of technical communication scholars have conducted preliminary research in nonindustrial sites (Kimball; Sauer; Tebeaux), these projects consist primarily of archival research; contemporary genres of nonindustrial technical communication – and the potential value of these genres as exemplars for the practice of technical communication – remain largely unexplored. My project both answers calls for research in nonindustrial sites and expands this research to contemporary sites by:

1) *Incorporating digital texts*. Nonindustrial forms of technical communication such as hobbyist message boards and hacker / mod communities proliferate in digital environments (see Kimball, 2006). However, preliminary research in nonindustrial sites research has focused primarily on print-based or oral communication such as books (Kimball) , letters (Tebeaux) or gestures (Sauer), neglecting contemporary forms of documentation such as user forums that incorporate digital multimedia. My project expands the analysis of technical communication in nonindustrial sites to include digital elements such as multimedia files, hyperlinks and dynamic chat environments.

2) *Emphasizing Users*. Most of the studies cited above only tacitly emphasize the needs and perspective of end users above the industrial designer's view (see, for example, Tebeaux' (1999) analysis of midwives as patient-centered medical practitioners). This dissertation explicitly draws on Johnson*'s user*-centered theory as a framework for analyzing, interpreting and evaluating nonindustrial technical communication.

In addition to extending technical communication research to extra-institutional sites, this dissertation directly challenges two assumptions concerning extra-institutional technical communication that I have identified within the extant research in this area. The first assumption concerns the value of extra-institutional technical communication: Because extra-institutional technical communication is usually generated by end users (and is not imposed top-down by industry codes and standards), research assumes that this communication is inherently more user-centered than traditional forms (although the research may not employ user-centered terminology). Often this assumption holds true. For example, Sauer's (2005) empirical study of miners' nonverbal communication finds that this communication embodies a localized "pit sense" that transmits invaluable information about conditions and hazards inside a mine. However, other research assumes a-priori that extra-institutional technical communication is inherently user-centered (see, for example, Kimball 2006), and we lack a complete picture of the problems and power struggles that can arise among users in extra-institutional sites. This dissertation finds that much extra-institutional technical communication is *not* user-centered, and that user-centered and non-user-centered strains may be present in the same thread of conversation (see Chapter 2). The second assumption concerns the

extensibility of concepts from traditional technical communication to extra-institutional sites. For example, Morain and Swarts (2012) suggest that effective extra-institutional technical communication, like traditional technical communication, should be clear, well-paced and free of irrelevant details. This dissertation, in contrast, uncovers instances of extra-institutional technical communication where invention supercedes "clarity", where pacing unfolds as a function of nonstandard dialects of English and where seemingly irrelevant details shift the conversation in a user-centered direction. By challenging the assumptions described above, I do not aim to contradict existing research so much as enrich it with new findings – including examples of extra-institutional users behaving exactly as established industries do.

Methods and Methodology

The "identity crisis" of disciplinary questions concerning the definition and scope of technical communication, detailed above, has in turn sparked a debate about technical communication methodology. Much of this debate centers on conflicting calls to employ new and cutting-edge methods from related fields such as usability on one hand, and to define or narrow technical communication methodology on the other (see, for example, Allen, 1990). Since the inception of graduate programs in technical writing in the 1970s (Connors, p.186), technical communication has maintained an open-ended methodological toolkit of qualitative and quantitative methods (Lay) aimed at both generating new knowledge and solving organizational problems (Gurak and Lay, 2002). A survey of current research anthologies in the field suggests a diverse methodological approaches – mostly qualitative -- ranging from qualitative text analysis (Berkencotter) to historical (Kynell and Selly) and ethnographic methods (Katz), and quantitative

methods such as quasi-experimental studies and usability testing (Grice). These diverse methods and methodologies adopted by technical communication have undergone subsequent modifications due to the unique questions raised by cyberspace research (Lay, 2002) and the evolving relationship between business and industry (Mirel and Spilka). Our discipline faces the challenge of finding its methodological bearings during a period of rapid change, both to research methods in allied fields and to technical texts – the objects of the methods – themselves.

Although technical communication methodology is diverse, three central methods have emerged as central to research in technical communication: ethnographic methods involving participant observation, rhetorical analysis drawing on concepts from classical rhetoric, and survey research used to "collect information" from writers and users of technical documents (Gurak and Silker, p. 412). Although these are traditional research methods widely used by related fields such as anthropology and composition studies, these methods pose special problems to technical communicators when "their primary data consists of electronic exchanges" in computer-mediated environments such as help interfaces and electronic support forums (Gurak and Silker, p. 404). These "new and novel" questions range from ethical questions surrounding copyright and anonymity to the logistics of conducting ethnographic research as a participant-observer in online environments (p. 405).   Gurak and Silker conclude that technical communication, which has always balanced textual analysis with rhetorical and ethical awareness, is uniquely positioned to "take the lead" in developing valid and ethical methods for researching talk about technology in virtual environments (p. 415).

Of these three methods, rhetorical analysis has played a "major" and perhaps the most central role in technical communication research (p. 409). Traditionally involving the application of theories from classical rhetoric to print documents such as speeches and technical handbooks, rhetorical analysis of digital texts poses unique problems because computer-mediated environments inherently complicate basic elements of rhetorical analysis such as audience and purpose. For example, whereas physical audiences are easily quantified, and print audiences are fairly anonymous, virtual audiences occupy a gray area as they are invisible but they can be "tracked" with embedded scripts. Also, due to endless reproduction of content via "mirror sites" the originating context and author of an online document is often impossible to trace. Similarly, the original nature and purpose of online documents is frequently occluded. Even if the originating author and purpose are determined, legal ambiguities involving permissions and fair use may emerge. For example, it is difficult to determine whether to consider an electronic corpus as a text or a conversation – classifications with differing legal and ethical implications for the researcher. Although rhetorical analysis is a powerful tool for analyzing technical communication in virtual environments, online exchanges are not speeches or textbooks – and the researcher must be prepared to grapple with the rhetorical, legal and ethical implications of virtual texts throughout the analysis.

Research Methods

Because hacker culture is constituted almost entirely by texts – specifically hypertexts – (see Thomas, p. xxvi), this study explores hacker culture through analysis of hacker texts. This project employs rhetorical analysis, a method that Gurak and

Silker define as "the critique of speeches or texts using elements from rhetorical theory" (p. 408; see also Halloran, 1984 for a discussion of the empirical nature of rhetorical analysis). Per Gurak and Silker, a "central" method in qualitative technical communication research, traditional rhetorical analysis involves the application of concepts from classical rhetoric (such as *ethos*) to the analysis of "public discourse genres" such as speeches (p. 408). However, technical communication has modified this traditional framework for its own purposes in two notable ways:

1) *Material for analysis*.

   Although rhetorical analysis is traditionally applied to public discourse, technical communication has adapted this method to technical discourse by "applying the same rhetorical concepts [i.e., as those used to analyze public discourse] … to genres such as software manuals, training materials, computer interfaces, professional discourse (memos, proposals, and feasibility reports), and so on "(Gurak and Silker, p. 408). Rhetorical analysis of technical discourses has included analysis of internal documents (Paradis, Dobrin and Miller, 1985), policy statements (see Coppola, 1997 and Coppola 2000 for analysis of environmental policy regulations) and nonverbal technical communication (see Sauer, 2003).

2) *Conceptual frameworks*

   Although most rhetorical analysis draws to some extent on concepts from classical rhetoric (Gurak and Silker; Fahnestock, 2005), concepts from contemporary rhetorical theory and communication studies have also proven applicable to the analysis of technical communication in contemporary contexts.

For example, Coppola's analysis of environmental policy statements (cited above) draws on concepts such as Luhmann's (1986) *ecological communication* to examine the multiple, overlapping systems of stakeholders that convene to deliberate about environmental concerns. Taken together, these twists on traditional rhetorical analysis have allowed technical communication scholars to adapt traditional rhetorical analysis to the forms of technical discourse (oral, nonverbal and written) that are embedded in contemporary technological systems.

Informed by Johnson (a technical communication scholar), Heidegger (a philosopher of technology) and Scheff (a sociologist), this project pursues the goal of developing rhetorical research methods relevant to contemporary technical communication by drawing on two ideas from contemporary social sciences: Heidegger's concept of meditative thinking, which can be summarized as thinking philosophically about use, and Scheff's concept of intersubjectivity, which is the sharing of subjective states. In order to describe the way these phenomena (meditative thinking and intersubjectivity) play out in my data, I introduce two new concepts to technical communication theory: *technitation* (techne + meditation), or meditative technical communication, and *phronectivity (phronesis + intersubjectivity),* or intersubjective technical communication.

Although I coined these terms to describe patterns I discovered in my data, both t*echnitation* and *phronectivity* have roots in classical rhetorical theory and draw on ideas from contemporary social sciences research. As the prefixes techne- and phron- suggest, these new terms link directly to techne and phronesis, two terms from classical

rhetoric that have figured prominently in philosophical discussions about the nature of technical communication. Most of these discussions concern one central question: which term best conceptualizes technical communication? For example, Miller's oft-cited landmark essay "What's Practical about Technical Communication" characterizes technical communication as *phronesis* or practice (p.). Setting up binaries such as "useful" (*techne*) vs "good" (phronesis) (p.22) , and a high and low sense of *practical*, Miller argues that conceptualizing technical communication as phronesis forces the discipline to question current practices vis a vis the good of the larger community and to emphasize practices that "maintain the life of the community". However, subsequent scholars have disagreed with Miller's conceptualization of technical communication as *phronesis.* For example, Ranney (2002) argues that practice as phronesis is too "embedded" in community values to provide a standpoint for critical distance and productive critique (p.211); citing Atwill, Ranney argues that technical communication as *techne* is a more robust figuration, with "the power not only to "transgress boundaries" but also to "rectify [sic] transgressions" (Atwill p. 48, qtd. in Ranney p. 212). As illustrated above, the meanings of *techne* and *phronesis* are terms under dispute in our field as scholars (re)define these classical concepts in ways that are relevant to technical communication. By linking this techne – phronesis debate to patterns and trends in my data, I illustrate that hackers, like technical communication scholars, are also deliberating about whether to conceptualize their practices as techne or phronesis – and the adoption of a techne-dominant approach to technical communication or a phronesis-dominant approach has striking consequences for the life of the community.

Just as the prefixes techne and phronesis have roots in classical rhetoric, the suffixes -meditation and -subjectivity link directly to terms and concepts from contemporary social sciences. For technitation, the suffix -(med)itation hearkens to Heidegger's distinction between calculative and meditative thinking, which Johnson (1999) has adopted for technical communication theory. In brief, calculative thinking about use consists of a superficial concern for end users as consumers; meditative thinking about use consists of a deep concern for the impact a technology will have on the lives and community of users (Johnson). **Technitation, then, is meditative thinking about use in a techne-dominant community.**

Like technitation, phronectivity also borrows a concept from contemporary social science: intersubjectivity. A term from anthropology, intersubjectivity is defined as the "sharing of subjective states" among individuals or groups (Scheff). In my data, intersubjectivity emerged as a key feature on the Lace Fronts forum, a phronesis-dominant community that deliberates at length about prudent behavior (or "game") for Lace Front wig wearers. In a universe of strategic games between Lace Front wig wearers and "weave-checkers", wig buyers and (sometimes unscrupulous) vendors, developing intersubjectivity is necessary to anticipate others' actions and act --- prudently. **Phronectivity, then, is the sharing of subjective states that within a phronesis-dominant community.**

Far from theoretical neologisms, these terms emerged during open coding as I attempted to describe patterns and trends I observed in my data. Importantly, these terms describe two interesting phenomena I observed: techne-dominant extra-institutional communities meditate about use, and phronesis-dominant hacker

communities share subjective states. Because technical communication theory traditionally assumes that technical communication is strictly task-oriented, these activities – meditating and sharing subjective states – are previously unexplored in technical communication theory. Therefore, my analysis explores the "extra" in extra-institutional technical communication – activities beyond strictly instrumental discourse in extra-institutional sites. As the analysis shows, these activities are far from superfluous chatter – indeed, they have a central role in shaping technical communication and the life of the community.

In order to conduct the rhetorical analysis proposed for this project, I collected multimedia data from 2 extra-institutional sites: Hackaday.com and the Lace Fronts forum on Blackhairmedia.com. Data collection will spanned 30-day period and included only the most active topics within this period; these active topics are identified by the moderators and tagged as "most commented on" on Hackaday and "hot topic" on BHM. The corpus for analysis included the following types of data:

- HTML files of all the active pages on each site (including the sitemap), preserving the page graphics, layouts and internal and external links as elements for analysis.

- Multimedia files, including instructional videos and other embedded media.

- Screen captures of design features as they appear on the screen, including interactive media such as pop-up quizzes, chat, and other dynamic content.

In digital communities, verbal data is indigenously segmented into posts or short single-author contributions. Therefore, I took posts as basic units for analysis for this study.

As I conducted the analysis, I employed a two-phase coding system that both explored themes of interest to contemporary technical communication theory and allowed new themes to emerge. Initially, I was simply interested in the relative dominance of techne and phronesis in these two extra-institutional sites. Therefore, in **Phase 1** I conducted rhetorical analysis by placing each post into the following coding categories. Taken from Book VI of the Nicomachean Ethics, these Aristotelian categories represent "states by virtue of which the soul possesses truth," or "habits of mind" (NE 6.3). These categories focus on two "states of virtue" : include techne and phronesis, which have figured prominently in technical communication research (see Table 1, p. 42)

Once Phase 1 was completed, I noticed a strong trend in my data: *techne* dominated the first site; *phronesis* dominated the second. Because techne and phronesis are key terms for technical communication scholars, I was interested in what these extra-institutional sites could tell us about technical communication research. Therefore, I simply asked: How do extra-institutional techne and phronesis compare with what we know about techne and phronesis in traditional technical communication sites? To answer these questions, I employed a simple open-coding system that

Table 1

Phase 1 coding categories (adapted from Nicomachean Ethics VI.1-7)

techne (art):	the mode of inquiry concerned with "deliberating and contriving" about how to make something (NE 6.4) *When hackers deliberate about how to (re) make technological artifacts, I classify the discussion as an instance of* techne*.*
phronesis (practical wisdom):	the mode of inquiry concerned with deliberating about how to act in a "good and expedient way" with respect to human to human goods (NE 6.5) *When hackers deliberate about how activities interactions should be conducted within the hacker community, such as how comments should be moderated, I classify the discussion as an instance of* phronesis

allowed patterns to emerge. I read and reread the data in four stages:

Stage 1: Codes: For each post, I noted key features for further analysis.

Stage 2: Categories: I generated a list of coding categories.

Stage 3: Concepts: I noted broader themes or concepts in the data.

Stage 4: Theories: I generated explanations of the phenomena I observed

(this four-stage coding scheme is patterned on Glaser and Strauss, 1967)

During Stage 3, two key concepts emerged: technitation and phronectivity, two

activities or "habits of mind" present in my sites that have not been addressed by

traditional technical communication research. This dissertation aims to describe and explain these phenomena, and explore implications for traditional technical communication.

Outline of Chapters

Chapter 1: Introduction to the Dissertation

This chapter has outlined the dissertation with a literature review, introduction to the research methodology and description of the extra-sites that constitute the focus of this dissertation. I also introduced two key terms: *technitation* and *phronectivity,* which emerged from my analysis of the sites.

Chapter 2: Technitation: Hackaday.org

This chapter investigates the web-based technical documentation of computer hackers participating in one hypertextual community: hackaday.com, which is a highly interactive, multi-authored weblog for advanced hardware and software hackers. Focusing on two specific threads, "Laser Tattoo" and "Dirk's Accident", I draw on Johnson's (2010) gloss of Heidegger's distinction between calculative and meditative thinking. This distinction illuminates the indirect nature of technical communication on Hackaday.com: much of the indirect (and seemingly off-topic) technical communication on the threads I analyzed serves to foster meditative thinking about technology within the context of a largely calculative, system-centered view. As technical communication explores extra-institutional sites, I argue that we must expand our view of technical communication on these sites to encompass indirect and non-instructional talk about technology.

Chapter 3: Phronectivity: The Blackhairmedia.com Lace Fronts Forum

This chapter moves from the documentation of software hackers, which constitutes the mainstream hacker community, to another extra-institutional community that has generated a substantial corpus of technical communication: the Lace Fronts forum on Blackhairmedia.com, a wig forum with an Afro-centric focus. While most technical communication research assumes that technical documentation must be written in Edited American English (EAE), this chapter illustrates that dialects such as African-American Vernacular English can powerfully shape not only the language of technical communication but also the content and structure. While this site may appear to be a quirky outlier, I argue that, as technology becomes embedded in global networks, sites such as Blackhairmedia.com will become the norm instead of the exception to the rule – and mainstream technical communication scholarship must therefore expand its focus to encompass technical communication in nonstandard dialects of English.

Chapter 4: The Role of Direct Instruction: Comparative Analysis of Two Sites

As Chapters 2 and 3 reveal, much of the day-to-day technical communication on my sites is indirect in nature: participants talk about technology, but they do not provide direct instructions for making and modifying technology. However, direct technical communication does sporadically occur on isolated threads, and generates much participation when it does occur. In this chapter, I comparatively analyze two exemplars of direct technical communication from my sites: "Stop Using Glue or Tape" on Blackhairmedia.com, and "Analog Joypad for your Retro PC" on Hackaday.com. To interpret the differences between these threads, I draw on Mitcham's (1993) distinction between the engineering and humanities perspectives on technological artifacts, and

the related distinction between techne and technology. These distinctions illuminate the meaning of technological instruction, and the limits of what can be taught.

Finally, I turn to the invisible status of nonindustrial technical communication and communicators within technical communication theory, pedagogy and research. In light of the proliferation of user-to-user technical communication online (Geisler; Miller; Koerber) , I suggest the nonindustrial technical communicator as a legitimate practitioner / stakeholder who is understood by traditional technical communication pedagogy, theory and research.

Chapter 5: Implications for the Field

In this brief chapter, I return to the two research questions that motivated this study: 1) "What do extra-institutional technical communicators do?", and 2) "Is extra-institutional technical communication necessarily more user-centered than traditional forms of documentation?" Finally, I address implications for research, practice and pedagogy.

CHAPTER 2

Introduction: Theorizing *Use*

User-centeredness has become a core value for technical communication: an ideal to which both the practice of technical communication and technical communication research aspire. This ideal has served as a galvanizing force for much technical communication research since the 1990s, including recent calls for "extra-institutional" research in technical communication (see, for example, Kimball, 2007). Frequently these calls for extra-institutional technical communication research are driven by a tacit assumption that users' indigenous technical communication is inherently more user-centered than the more traditional technical documentation underwritten by corporations (see Mitchell, 2003; Koerber, 2006; Kimball, 2006; Blair, Gajjaland and Tulley, 2008; . But *is* extra-institutional technical communication inherently more user-centered than the traditional forms of documentation employed by industry? This chapter challenges our assumptions about the inherently user-centered nature of extra-institutional technical communication by evaluating ideas about users that circulate within one extra-institutional site: Hackaday.com, a popular technology blog about hacking.

But what does it mean to be user-centered? The ideal of user-centeredness certainly has become "ubiquitous", driving research in multiple areas of technical communication scholarship (Johnson; Ranney; Koerber; Sauer;Mirel) , technical communication pedagogy, and academic-industry partnerships (Dicks ; Bosley). However, even as user-centeredness has become a widespread ideal in technical communication research, our understanding of what it means to be user-centered is in

danger of becoming "superficial" or even "meaningless" (Johnson, p. 335-336). In fields related to technical communication, user-centered themes have arguably been employed "with little historical reflection and concomitant foresight" (p. 338). For example, in design fields the once-radical concept of user-centered design (UCD) has often been "subsumed under practice", i.e., employed as a strategy for solving "short-term problems" with products that may be designed without incorporating users at early stages and subsequently be marketed with no long term strategy for incorporating users' perceptions and experiences (p. 336). In "The Ubiquity Paradox", Johnson attempts to save user-centered theory from "the landfill of ideas" by offering a philosophical exploration of one key term: use (p. *336)*.

Use, Johnson argues, is under-theorized. Johnson's essay therefore attempts to develop a "richer" and more theoretical understanding of this concept. To move beyond superficial, everyday definitions of use, Johnson draws on two related methods: 1) the "craft" of meditative thinking, a Heideggerian method of inquiry that entails contemplating seemingly incongruous ideas to arrive at a "deeper and more philosophical and rhetorical understanding" (Johnson, p. 339), and 2) the concept of *techne* from classical rhetoric (p. 336) a richer conception of making that Heidegger argues has been completely replaced by the modern term *technology*, a diminished conception of making that reduces *techne*'s consideration for the artisans, materials, form and end use of human artifacts to mere concern for the "things made" (p. 344). By employing meditative thinking and applying the concept of *techne* to "modern contexts", Johnson theorizes use, developing a richer conception of user-centeredness than the superficial, technological sense in which user-centered theories are often applied:

superficially, in service of the things made instead of the richer context of making.

The ancient concept of *techne*, Johnson argues, can restore the "stripped" concept of technology to its richer meaning associated with the classical understanding of making (p.343). Whereas technology reduces making to a concern for products and their (efficient) production, *techne* is an expansive concept incorporating multiple causes that bring an artifact into being: the end use (*telos*), the form (*eidos*) materials and the artisan, who possesses understanding of the techniques employed in his or her crafts. Clearly, the concept of *telos* or end use bears the most direct relevance to Johnson's attempt to theorize use. More importantly, though, *techne* suggests that craft or making must encompass an understanding of *all t*he causes involved in making as an organic and interrelated whole. Furthermore, the arts themselves exist in interrelation, with the "guiding arts" concerned with general human welfare -- religion, education, philosophy, and statesmanship – subordinating the "lower arts" involved in the production of artifacts. With an understanding of all the causes of making and in service to the guiding arts, techne is positioned to contribute meaningfully to human affairs. When one aspect of techne becomes over-emphasized to the expense of others, or when the lower productive arts such as computer programming begin to dominate and control the guiding arts such as education, technological "inversion" occurs (Wild, 1941; qtd in Johnson, p. 345). Artifacts become abstracted from their rich sense as techne and become merely technological, with the power to "disrupt" and endanger human good. Within Johnson's framework, use becomes the "bring[ing] forth" of artifacts into the world of human interaction (p. 345), an action that should shape the production of artifacts, and employ the values of the higher arts. In this sense, user-centeredness

implies care for the user's entire lifeworld – a world that includes the artisans, materials and forms that drive technological production.

This rich concept of user-centeredness is the standard by which I suggest we evaluate extra-institutional technical communication. However, as Johnson suggests, this type of user-centeredness cannot be contemplated or attained through traditional modes of inquiry. As I began this dissertation, my initial research question was, "Is nonindustrial technical communication necessarily more user-centered than the traditional forms of documentation employed by industry?" Johnson's meditation on the term *use* suggests fruitful starting points for answering this question with respect to different forms and iterations of nonindustrial technical communication. First, *use* – and user-centeredness – cannot be critically interrogated or theorized through calculative thinking. Calculative thinking, Heidegger argues, is a mode of inquiry deeply implicated in modern industrial technology, a form of technology that diminishes and dismisses the importance of use. Therefore, to question use through calculative thinking will only uphold the modern industrial status quo of disregarding users; scholars must employ meditative thinking to step outside modern technology and discover deeper meanings for use and user-centered. In more practical terms, we cannot evaluate the user-centeredness of a technology by questioning whether a given technology "serves specific purposes" (Heidegger p. 46, qtd in Johnson p. 338). Rather, as Johnson argues, we must employ meditative thinking to contemplate whether a given technology adequately galvanizes its artisans, materials, purposes and end users in the service of "guiding" arts aimed at the good of human society such as education and statecraft. Only if awareness and contemplation of users permeates every aspect of production,

from artisans to materials and forms and end users, and the technology is subordinated to arts that contribute to their well-being, can a technology truly be considered user-centered.

Certainly, on the Worldwide Web, technical communication trends toward some brand of user-centeredness – no matter how superficial. Technology giants such as Apple own and manage large online "support communities" where end users can interact "with fellow Apple product users from all around the world" (see, for example, discussions.apple.com). While proprietary, these forums are built to be user-driven; paid technical staff mostly "lurk" on these forums to monitor and moderate activity without posting. However, the user-centeredness of moderated proprietary forums is at best superficial; arguably, companies like Apple have merely duped users into performing free labor as unpaid technical support staff – all under the guise of user-driven "communities". Numerous non-proprietary technical communication sites have also appeared on the scene (www.instructables.com); these extra-institutional sites include a mixture of technical information, including basic help instructions and user-generated modifications to a technology ("mods").

Arguably, one form of extra-institutional technical communication stands out as an exemplar: the *hack*, which I define here as a modification to a technology that makes new affordances by breaking constraints. Or as one user puts it, a mod is an "add-on" ; hacks, in contrast, alter the underlying structure or code of the technology itself. While hacks are present on mod sites and even sometimes appear on proprietary forums, this form of technical communication is primarily found on extra-institutional sites devoted exclusively to hacks and hacking. Succinctly, hacks are an exemplar of extra-

institutional technical communication on the Worldwide Web.

Because I am interested in evaluating the user-centeredness of extra-institutional technical communication, I begin by analyzing hacks as a popular and exemplary form in Chapter 2. To move beyond the simplistic (corporate) sense of user-centeredness described above, I draw on Johnson and Heidegger to offer a more rigorous standard: user-centeredness is care for the user's whole lifeworld; it evolves as the user's lifeworld evolves, employing meditative thinking to discover new meanings, problems and challenges related to use. Then, in the subsequent chapter, I branch out to less popular, less visible extra-institutional sites not explicitly devoted to hacking.

Hacks in Action: Description of the Hackaday.com Research Site

Below, I analyze ideas about users that circulate within one extra-institutional technical communication site: Hackaday.com, a collaborative technology blog that "serves up fresh hacks daily" (par. 1). As explained above, *hacks* are short step-by-step instructions for modifying a technological artifact; these hacks make up the bulk of technical communication on

Figure 1: Hackaday.com Header.

Hackaday.com. The phrase "serves up" indicates that the hacks found on Hackaday.com are not original material. Instead of composing original hacks, the

Hackaday.com contributors comb the Worldwide Web for interesting hacking projects and report on these projects to Hackaday.com. Each *hack* consists of a blog post with a multimedia summary of the hack, a link to the original hacker's project and reader comments. In addition to hacks, some of the blog posts on Hackaday.com address contextual issues such as general developments in technology and reader comments. Reader reception of these non-hack posts is mixed; when readers judge a post as too off-topic, the refrain "not a hack" appears frequently in the reader comments (see, for example, "Rock Afire" and "Backyard Ogre Catapult").

The layout of Hackaday.com is that of a traditional blog. Set against the black page background, a skull-and-crossbones header emphasizes the element of danger popularly associated with hacking activities [see Illustration 1]. However, as with most hacking sites, most of the hacks presented on the site are neither dangerous nor illegal. The main text
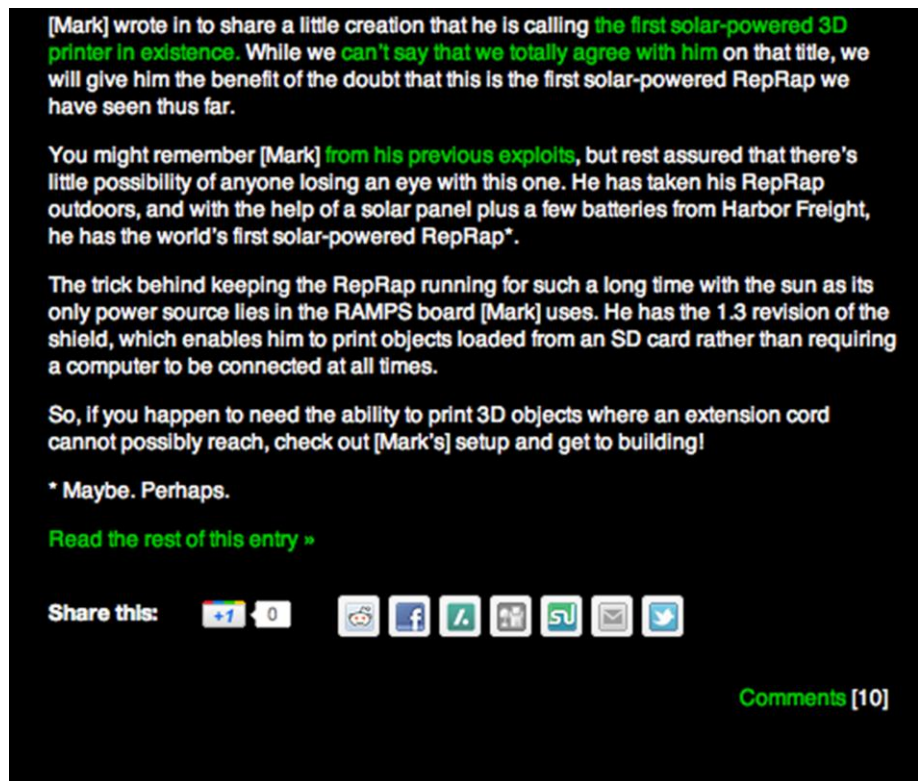
Figure 2: Hackaday.com Main Text Column

column contains the contributor's multimedia write-up of the hack and a link to the original project [see Illustration 2 *above right*]. A right-justified text column contains

navigational elements such as "featured" (hacks suggested by the contributors) and "most commented on" (hacks with the most reader activity). The comments section -- the main locus of activity on Hackaday.com -- consists of a stark, text-only box underneath the main text comment [see Illustration 3, p. 9]. Advertisements figure prominently in all areas of the site, but particularly in the austerely designed comments section, where ads are the only images on the screen. This stark comments box is where Hackaday.com participants -- hackers, contributors and readers -- theorize *use*.

Research Methods: Analyzing *Use*

This analysis of the Hackaday.com site is guided by the following central research question: How user-centered is communication on Hackaday.com? Drawing on Johnson and Heidegger, I am interested in two measures of user-centeredness on Hackaday: user concepts (superficial focus on tasks vs. care for the user's entire lifeworld) and modes of inquiry (calculative vs meditative). My central philosophical question, 'Is Hackaday.com user-centered?', is here rephrased as two research questions:

USER CONCEPTS :	How frequently do Hackaday.com participants mention users, and how are users represented?
MODES OF INQUIRY :	Do participants draw on calculative thinking, meditative thinking or both when talking about users?

Analyzing these aspects of Hackaday.com – user concepts and modes of inquiry – will allow me to measure actual nonindustrial technical communication practices at one site against our hopes and expectations for these sites. As discussed above,

hacker sites are exemplars of extra-institutional technical communication. If Hackaday.com participants discuss users only rarely – or represent them superficially – then extra-institutional status does not necessarily correlate with user-centeredness. Conversely, if communication on Hackaday.com richly represents users and employs meditative thinking to explore their problems, then this and other extra-institutional sites may serve as exemplars of user-centeredness for traditional technical communication. Of course, real communication does not adhere well to such binaries. Regardless of how we evaluate its user-centeredness, the complex and varied nature of of extra-institutional technical communication can tell us much about the range of possibilities for technical communication when institutional constraints are muted or removed.

To answer my research questions, I collected data from the Hackaday.com site primarily in the form of HTML files, including structural navigation links, the blog posts themselves, any embedded media (such as YouTube videos), reader comments, graphics and advertisements. Taken together, these data are the basic components that make up all technical communication on Hackaday.com.

Figure 3: Hackaday.com Comments Section

Once I collected all the data that comprises technical communication on Hackaday.com, I segmented the it into *posts.* Posts are the single-author entries that make up the content of any blog; therefore, posts are an emic

or indigenous unit of data recognized by the Hackaday.com participants themselves. After segmenting the verbal data into posts, I then analyzed this data across two axes of coding: user concepts (i.e., whether communication centers on artisans, materials, forms or use) and modes of inquiry.

Because Hackaday.com is a vast archive of hacks, I selected two popular hacks for this analysis: "Laser Tattoo", which converts a laser printer into a tattoo machine, and "Dirk's Accident", which reviews an accident caused by neodymium magnets. Both hacks are representative of technical communication on Hackaday.com in content and length, and both were tagged as "most commented on" in the month they were published. In addition, both hacks involve technological artifacts that modify a part of the human body that is arguably the most important participant in technological production: the human hand. .

This analysis of "Laser Tattoo" and "Dirk's Accident" aims to evaluate ideas about use on Hackaday.com . To answer my research questions, I coded the data as follows:

Research Question 1: User Concepts: How frequently do Hackaday.com participants talk about users, and how are these users represented?

In order to address this research question, I first answered a broader one: How often do Hackaday.com participants talk about making (techne) overall? Technical communication scholars contrast techne with phronesis, which Aristotle defines as "action in the sphere of human goods" (NE 6: v, qtd in Miller, p. 68). Therefore, in my first pass through the data I categorized each post as either making (techne) or talking about procedure (phronesis) according to the content of the post. This provided me with a broad view of the overall proportion of talking about making to talking about

procedure on Hackaday.com (see Table 2. P. 57).

Table 2

Techne and Phronesis on Hackaday.com

Hacks	Talk about making (techne)	Talk about procedure (phronesis)
"Laser Tattoo" (46 posts)	44 posts	2 posts
"Dirk's Accident" (56 posts)	55 posts	1 post

This initial coding phase highlights my first significant finding about communication on Hackaday.com: at least for these two popular threads, making (techne) dominated the conversation. Participants spent most of their time on Hackaday.com discussing the hacks themselves, not procedural issues such as etiquette and blog rules. Once I had identified all the techne posts, I was positioned to analyze the frequency and richness of conversations about users. Like Johnson I viewed users as a component of the Aristotelian four-cause framework for techne. Using the four causes as coding categories, I labeled each post according to the following categories (which correspond to the four subcategories of techne in Aristotle's four-cause schema) based on the content of each post:

Artisans, or the individuals / groups involved in the (re) production of an artifact.

Materials used in the production of an artifact.

The **forms** guiding the production of an artifact, such as blueprints and models.

The **telos** or end use of an artifact by the user.

Table 3 summarizes my findings (p. 58):

Table 3

Techne on Hackaday.com

"Laser Tattoo"		"Dirk's Accident"
Artisans	5 comments	1 comment
Forms	7 comments	1 comment
Materials	4 comments	14 comments
Telos (end use by users)	49 comments	31 comments

The above table highlights my second significant finding about technical communication on Hackaday.com: End use by users is a recurring theme addressed – at least superficially – in most of the posts.   But as Johnson points out, talking about users is an insufficient criterion for user-centeredness; one problem in contemporary technical communication is that users may be incorporated superficially, with no care for the user as an evolving entity within a complex lifeworld. Once I identified conversations about users on Hackaday.com, I was finally positioned to closely read these conversations and gauge the user concepts they presented.

Research Question 2: Modes of Inquiry: Calculative and Meditative Thinking

Johnson recommends a rich, rather than superficial, conceptualization of use. Richness and superficiality are relative terms, difficult to operationally define for rhetorical analysis.   At first glance, it is easy to determine that Hackaday.com participants talk about users; the richness or superficiality of these conversations is a more subjective matter.   Systematically evaluating conversations about users on Hackaday.com was a challenge.   Drawing on the philosophical exploration of user-centeredness discussed at the beginning of this chapter (Johnson), I took Heidegger's distinction between calculative and meditative thinking as a rhetorical yardstick for measuring conversations about users on Hackaday.   My analysis rests on a simple assumption: Calculative reasoning about users represents a superficial perspective

because the ultimate goal of calculative reasoning is technological progress and profit – users matter only inasmuch as they potentially stand in the way. Meditative reasoning, in contrast, represents an adequately rich perspective on users if only because the work of meditative thinking is never finished: meditation dwells deeply on questions over time, rejecting easy answers or premature closure of questions and problems. Of course, operational definitions of calculative and meditative thinking do not figure prominently into Heidegger's work – in fact, the attempt to define these terms operationally may itself be a move away from meditation and towards operational thought. I therefore resisted closure as well as an empirical investigation can, converting Heidegger's philosophical categories into broad and fuzzy definitions that describe these philosophical categories without delimiting them. Because this dissertation concerns user-centered technology, I draw heavily on Johnson's gloss of Heidegger to construct these categories:

Calculative thinking about use recognizes users' concerns, but subsumes them to a greater concern for the "things made" (Johnson, p. 344). In this superficial conception of use, users' concerns are a means to a specific end: the mass marketing of a product / artifact to as many users as possible for economic benefit to the designer / artisan. Depending on the situation, users may provide insights that help the designer market the artifact/ product to as many consumers as possible or raise concerns about an artifact / product that pose an inconvenient stumbling block to the mass marketing of a product. Often users are not consulted at all; rather, users' concerns are reduced to legal regulations that must be met prior to mass marketing a product.

Meditative thinking about use emphasizes use as the *telos* of technological production and subsumes all other factors – artisans, materials and forms – to concern for the end user. In brief, meditative thinking about use strives to solicit – and imagine – the range of all possible user perspectives concerning an artifact. This may be an impossible ideal; however, meditative thinking about use noticeably avoids reducing users to a one-dimensional entity represented by legal regulations, statistics or short-sighted focus groups. Rather, meditative thinking about use aims at a rich description of users' concerns by taking the users' perspective, contemplating multiple aspects of the user's world (the context of use) and inviting the user to speak for her-or-himself. The conversation about use is open-ended and informed by multiple and contradictory user perspectives; often user concerns are viewed as a valid "brake" to fast-paced technological development.

These broad and fuzzy coding categories enabled me to analyze the richness of conversations about users on Hackaday.com, allowing me to see each comment about users in its context and gauge its overall impact on the hack. On my third pass I reread my data and categorized each post as calculative, meditative or both (for multi-faceted posts). The results of this analysis constitute my most significant findings about technical communication on Hackaday, delineated in Table 3: For both hacks, meditative threads coexisted alongside calculative ones; in this extra-institutional technical communication site, user-centered technical communication emerges with instead of in lieu of traditional (i.e., calculative) forms.

Table 4

Calculative and Meditative Thinking on Hackaday.com

Thread	Type of Thinking	# of Posts
"Laser Tattoo" (n=46)	Calculative	8 posts
	Meditative	38 posts
"Dirk's Accident" (n=56)	Calculative	5 posts
	Meditative	51 posts

However, numbers tell only part of the story. The analysis below illustrates the specific nature of technical communication in extra-institutional sites, which spans traditional forms such as quantitative equations and experimental forms such as analogy, hyperbole and tall tales.

Findings of the Analysis

User Concepts and Modes of Inquiry on Hackaday.com

Analysis of "Laser Tattoo"

All hacks on Hackaday.com begin with an initial blog post by a contributor, which introduces and summarizes a hack for discussion. It is important to note that these hacks are collected "from around the Web" and are not the contributors' original work; the contributor's work is to introduce the hack to Hackaday.com participants for discussion. Although the contributors (who are paid writers for Hackaday.com) have some privilege in selecting and presenting topics for discussion – and may even try to directly shape the discussion by posing specific questions as prompts – participants often have other ideas. Often the Hackaday.com participants discard the contributor's ideas and take the conversation in an entirely new direction; the "Laser Tattoo" hack illustrates this phenomenon well. In the worst case scenarios, participants reject the contributor's selection because it is "not a hack" or engage in ad hominim attacks

against the contributor himself.

Introduced by contributor <Eliot Phillips>, "Laser Tattoo" is a hack that converts an Epilog laser cutter into a tattoo machine that etches scanned images onto human skin. Unlike the reader comments, which focus almost exclusively on *telos,* <Eliot Philips>' initial post focuses primarily on materials. As <Eliot Philips> explains, the mechanics of the hack are simple: insert a human hand into the cutter instead of traditional materials such as wood or glass (the original hacker uses masking tape to block out hand position). This hack therefore collapses two of Aristotle's causes into one entity: the materials, human skin, are also a part of the user's body, a hand.

All hacks on Hackaday.com explicitly aim to satisfy the value of "fresh[ness]" or novelty; this criterion poses a challenge for the contributor of "Laser Tattoo". As <Eliot Phillips> acknowledges, "Laser Tattoo" is not unique: other hacks have used laser cutters to etch images into human tissue. Further, the mechanics of the hack are simple and lean heavily on a pre-existing technology: the laser tattoo machine is simply an Epilog laser cutter with "a magnet over the safety switch" (par. 1). By posting this less-than-novel hack, <Eliot Phillips> risks a negative review from readers.

Therefore, in order to justify the "fresh(ness)" of "Laser Tattoo", <Eliot Philips> valorizes the original hacker, <tetranitrate>, in dramatic language that highlights two risks that the machine poses to the user: Pain and danger.

<tetranitrate>, of <u>LED chess set</u> fame, posted his experiences <u>using a laser cutter to scarify his own skin</u> (<Eliot Phillips>, par. 1)

Figure 4: Laser tattoo on an Unidentified User.

<Eliot Phillips>' short write-up dwells on these themes – pain and danger to the user-- , citing the "very painful" process of "scarifying" human skin the "discomfort of smelling your own flesh" , as opposed to the "less painful" versions of this hack previously discussed on Hackaday.com (Phillips, par. 1).

To conclude the hack, <Eliot Phillips> embeds a video from original hacker <tetranitrate> of the laser tattoo machine in action. Like <Eliot Philips' write-up, the embedded video dwells on the theme of pain. With old-school hip hop group Run DMC playing in the background, the users (who are unidentified young, white males) alternate laughing and yelling in pain as the machine etches graphic logos on their skin: the instructables.com robot, packman and the packman ghost (see Illustration 4). Arguably, <Eliot Philips> views inherent danger as a material akin to the laser cutter and the human hand: a key ingredient inevitable – or even required – for a properly functioning laser tattoo machine. As users operate the machine, danger is converted to pain – which is a product inextricably bundled with the laser tattoo itself. In <tetranitrate's> video, it is the redness (a sign of pain) on the users' hands that allows them to show off the etched white tattoo design. On uninflamed Caucasian skin, the pale white laser

tattoo would be virtually invisible.

As mentioned above, Hackaday.com contributors have the privilege of selecting topics and themes but participants may take the discussion in a new direction. On "Laser Tattoo", <Eliot Philips'> favorite topic – pain – is scarcely discussed in the comments at all. Readers entirely drop this theme with the exception of one (1) comment about the related technology of laser tattoo removal:

> I had my tattoo on my foot removed last year and it was a bit painful (<Eve
> Reid>, 5 May 2010).

Instead of dwelling on superficial pain and redness, Hackaday.com participants explore a deeper issue: the end use (telos) of the laser tattoo machine by prospective users.

In fact, this conversation about end use eclipses other concerns. Conspicuously absent from the comments is any discussion of the materials and technical processes involved in building the laser tattoo machine, with the exception of 2 comments from reader DarkLasers about laser tattoo machines this user has built (see <Darklasers>, 1.21.2009). No participants express desire to build a laser tattoo machine or ask about processes and materials. Instead, the overwhelming majority of the comments focus on end use (telos). And, whereas <Eliot Phillips>' initial write-up focuses on the immediate products of the machine (superficial redness and a laser tattoo), participants expand the conversation to the possibility of a wider demand for the machine and the latent consequences of its use. Within the Aristotelian framework, all of these conversations fall within the category of telos or end use by the user. The readers of "Laser Tattoo" certainly are user-focused, if not user-centered.

It is within these conversations among readers among use that Johnson's

distinction between *superficial* and *deep* understandings of use become most relevant. More specifically, reader comments about "Laser Tattoo" separate into two distinct threads, which I will refer to as follows: 1) the FDA approval thread, which focuses on the conditions of hypothetical FDA approval for the laser tattoo machine, and 2) the latent risks thread, which focuses on hypothetical risks the laser tattoo machine poses to human users. Both threads concern the telos, or end use, of the laser tattoo machine; both threads focus on hypothetical scenarios of use. However, as shown below, the FDA thread employs calculative thinking about use, reducing user concerns to the problem of FDA approval that hacker <tetranitrate> may need to attain before mass marketing the machine. The latent risks thread, in contrast, maps out the potential risks of the machine to human users, ranging from no risk to permanent alteration of the body and cancer. Offering only the general advice "use with caution!" (<zeropointmodule>, 5.25.2009), the latent risks thread acknowledges that the potential risks of using the "Laser Tattoo" machine may be impossible to predict and control.

The FDA Approval Thread: Calculative Thinking about Use

Both the FDA approval thread and the permanent damage thread arise from an exchange that occurs early in the reader comments when reader <emilio> encourages <tetranitrate> to mass market the laser tattoo machine:

Make a small one, get it FDA approved! it's the wave of the future! (<emilio>, 7.5. 2008)

Nothing in <tetranitrate>'s original hack or <Eliot Philips>' write-up suggests an intention to market the laser tattoo. If anything, <tetranitrate> and <Eliot Philips> play up the extreme "brave(ry)" and pain tolerance the machine requires; presumably, the machine

can only be used by users who possess these special qualities. In addition to generating the FDA approval thread, <emilio>'s initial remark also serves as a precursor to the permanent damage thread, which originates when reader <redleader> replies to <emilio>:

How long does it last? I bet if the FDA studied it, it would show that it gives everyone

skin cancer (<emilio>, 7.5.2008)

After reader <redleader>'s comment, the two threads diverge. Dovetailing on member Emilio's comment, the FDA approval thread deliberates about the hypothetical question, *if* <tetranitrate> *decides to mass market the laser tattoo machine, would FDA approval be necessary?* The latent risks thread, in contrast, deliberates about potential risks to the human user irrespective of FDA approval. Taken together, these two threads illustrate the tension between calculative and meditative thinking about use on hackaday.com and the role of the reader comments section as a site where these tensions can play out on a blog that is otherwise dominated by the choices and viewpoint of the Hackaday.com contributors.

Unlike the latent risks thread, the FDA approval thread does not contemplate the potential reasons for FDA regulations of laser devices or ways of building the device in compliance with regulations. Instead of discussing the real risks to users that may guide these regulations, readers move immediately to a discussion of whether or not the laser tattoo machine falls under the "jurisdiction" of the FDA:

Why would the FDA have to approve it? A laser tattoo gun is not a food item or a drug (<jarhead jay>, 7.25.2008)

Reader <jarhead jay> later adds "unless somebody can show otherwise", an acknowledgment of the rhetorical, flexible nature of FDA regulations. This rhetorical awareness is a recurring theme of the FDA approval thread: FDA regulations are viewed as flexible entitles responsive to deliberation and revision; they contain "loopholes" that can be exploited by traditional engineers and hackers. For example, in the next comment in the FDA approval thread, reader <troy nall> suggests that FDA regulations may eventually encompass laser tattoos:

And I too believe the FDA would not have jurisdiction on this. But you know lawyers are biting at the bit on this one. (7.8.2008)

However, in the next comment in the FDA approval thread <jededia> temporarily disrupts the rhetorical understanding of FDA regulations posited by <jarhead jay> and **<**troy nall> by defining the scope of FDA regulations:

To <jaryhead jay>, any product that emits electromagnetic radiation are regulated by the fda including things something tv, dvd (< jedediah**>,** 1.20.2009)

Then <jarhead jay> counters:

@ Jedediah: You are confusing the FDA and the FCC, which regulates all things radio and such (1.20.2009)

Drawing on his ethos as a US Customs Officer to reassert his definitive answer to the hypothetical question around which the FDA approval thread centers, <jedediah> responds:

gen, trust me, i deal with the forms every day. i'm a u.s. customs broker. anything that *emits radiation requires not only fcc docs, but also an fda radiation declarationform* http://www.fda.gov/opacom/morechoices/fdaforms/FDA-2877.pdf check it out if you don't believe me (<jedediah>, 1.21.2009)

Above, <jedediah>'s response would appear to pose a definitive answer to the question, providing closure to the FDA approval thread. According to FDA documents, the FDA must approve the laser tattoo device. Indeed, <jedidiah> temporarily stands as the definitive authority on FDA regulation. But after several months elapse on the site, <jedediah>'s explanation is in turn countered by another participant who again draws on personal ethos and expertise: a comment from participant <darklasers>, who claims to build, sell and transport laser tattoo machines and similar devices. As reader <darklasers> explains, a "loophole" exists in the FDA regulations that can be exploited to market lasers without FDA approval. I have quoted <darklaser>'s post in full to illustrate the participants' calculative reasoning about FDA approval:

To Jebadia – The FDA regulates the living HECK out of handheld lasers (My Expertise) it's quite annoying, the trick is (if your shipping/selling/transporting a laser OVER 5mW "wich isnt much at all") you need to slightly diss-assemble it. most handheld lasers have a tail-cap, such as the LED flashlights we mod and make heat sinks for in order to make the smallest/most powerful handheld lasers available to the public. this tail cap can be removed to EFFECTIVLY render it an INCOMPLETE unit, thus bypassing certain FDA regulations (wich are quite foolish, but i understand… we don't need the next Osama to get ahold of severe laser tech…)but your very right, the FDA goes nuts over lasers now, especially in the last

year, makes it hard to ship my "complete" laser builds to non-US countries. (<darklasers>, 5.25.2009)

As <darklasers> explains, FDA regulations are an "annoying" roadblock to marketing handheld laser devices; the FDA is irrationally "go(ing) nuts" over these devices; therefore, a "trick" or "loophole" must be employed to circumvent these irrational regulations.   Only parenthetically does reader <darklasers> acknowledge a valid rationale behind the "foolish" FDA regulations: preventing terrorism ("we don't need the next Osama to get ahold of severe laser tech .."). As reader <darklasers> represents the problem, only a terrorist user would render the laser tattoo machine dangerous to humans -- for normal users FDA regulations are "foolish".

In summary, the FDA approval thread in the reader comments of "Laser Tattoo" exemplifies Johnson's critique of the superficial treatment of users in contemporary technical communication. Readers certainly discuss the telos or end use of the "laser tattoo", but this discussion is superficial, focused on circumventing FDA regulations to make this "nerd core" advice available to as many users as possible (see arthur, 1.20.2009).   In sharp contrast, the permanent damage thread (see below) uses meditative thinking to *dramatize* the range of hypothetical risks the laser tattoo machine may pose to users; although readers do not reach consensus regarding the actual level of risk, this conversation provides a starting point for imagining the short-and-long-term impact a simple handheld laser tattoo device may have on a world of real human users.

The latent risks thread: Meditative thinking about Use

Alongside the FDA approval thread, which examines whether FDA approval would be a necessary step in marketing <tetranitrate>'s laser tattoo machine, a second

thread evaluates <tetranitrate>'s hack in terms of human costs. I term this the latent risks thread because it dwells on hypothetical damages that the laser tattoo machine might cause over time to human users -- specifically, to damages to the human hand and other organs by extension.   A single question guides this thread: is there more to a laser tattoo than meets the human eye?   After the initial "pain" and "redness" fade, users may be plagued by long-ranging side effects from cancer to eventual dismemberment. Because this thread is not *calculative*, the purpose of the latent risks thread is not to calculate the statistical probabilities of these risks or to weigh these possibilities against the advantages of the laser tattoo machine.   The latent risks thread does not pursue closure. Instead, the purpose of the latent risks thread is to enumerate the full complement of potential risks -- and, more philosophically, to explore the latent and invisible effects of a certain technological adaptation for a specific human community over time: the online community of hackers.

As suggested above, the exploration of latent risks on Hackaday.com is closely aligned with what Heidegger terms *meditative* thinking. As Heidegger explains in his (1966) Memorial Address , meditative thinking is exploratory in nature -- it is an act of resistance against the calculative obsession with finding the "quickest and cheapest way" to produce more technological artifacts (p. 1):

> Meditative thinking demands of us not to cling one-sidedly to a single idea, nor to run down a one-track course of ideas. Meditative thinking demands of us that we   engage ourselves with what at first sight does not go together at all. (p. 4)

As Heidegger's above remarks delivered 42 years before hacker <tetranitrate> transformed a laser printer into a tattoo machine suggest, to think meditatively about

laser tattoos means resisting the impulse to circumvent FDA approval and mass-market the laser tattoo machine. Instead, meditative thinking means asking open-ended questions about humans, lasers and tattoos -- and about other actors and artifacts that readers may wish to bring to bear on the laser tattoo conversation.

But meditative thinking is not simply equivalent to the popular concept of lateral thinking, or creative and indirect reasoning as psychologist De Bono defines it (see De Bono, 1972, Lateral thinking: Creativity Step-By-Step). Nor is it a mere process of free association. According to Heidegger, meditative thinking touches upon -- without totally uncovering, "the meaning hidden in technology" (p.):

> There is then in all technical processes a meaning, not invented or made by us, which lays claim to what man does and leaves undone. We do not know the significance of the uncanny increasing dominance of atomic technology. The meaning pervading technology hides itself. But if we explicitly and continuously heed the fact that such hidden meaning touches us everywhere in the world of technology, we stand at once within the realm of that which hides itself from us, and hides itself just in approaching us. That which shows itself and at the same time withdraws is the essential trait of what we call the mystery. I call the comportment which enables us to keep open to the meaning hidden in technology openness to the mystery (p.)

Applying Heidegger's philosophical remarks to the laser tattoo machine, meditative thinking in this context explores aspects of the laser tattoo machine that are not readily apparent "at first sight" (p. 2). Even as contributor <Eliot Philips> presents "Laser Tattoo" to the world of Hackaday.com, the laser tattoo machine "hides itself"; this

"hidden meaning" encoded in the laser tattoo machine "touches us everywhere" (Heidegger). It is this latent dimension of "Laser Tattoo" that the latent risks thread seeks to explore.

It is telling that the word telos translates as "end"; conversations about the end purpose of a technology usually strive for closure. What is the point of this artifact? What is its purpose? When technical communication examines the telos or end use of a technological artifact, this exploration typically ends with localized use in context: riding a bicycle, driving a car, using a phone. Of course, in the calculative thread the consequences of use are limited to phenomena that can be observed and studied:

I bet if the FDA studied it, it would show that it gives everyone skin cancer (<redleader>, 6.5.2008).

But, regardless of how Aristotle himself intended this term to be used, telos has potential as a more expansive philosophical category. Localized uses of a technology aggregate into mass-market adoption, transform relationships, leave an ecological footprint, and reverberate in all areas of human culture. As mentioned above, the Hackaday.com readers push the boundaries of technological ends beyond the immediate context of use to latent risks that the laser tattoo machine poses to the human community. The latent risks thread begins and ends exactly as Heidegger envisions: with an "openness to the mystery":

Lasers can burn deep into the skin and do much more damage than you would expect from the visible injury (<zeropointmodule>, may 25 2010)

Although <Eliot Philips>' video of the laser tattoo machine in action limits the time frame to seconds after use and the consequences to pain and redness,

<zeropointmodule> acknowledges that latent risks may be present that are not apparent at first sight. The dangerousness of the "Laser Tattoo" hack is not self-evident precisely because its existence is so localized and inaccessible to observation. No other such laser tattoo machine exists, and readers, who are in remote locations, cannot study hacker <tetranitrate>'s machine firsthand. Therefore readers must employ a rhetorical device to assess the laser tattoo machine: *analogy*. In the meditative thread, readers pose analogies to other machines, real and imaginary, guide their exploration of the latent risks the machine may pose. In addition to being rhetorical, this method of determining latent risks is by nature meditative. It can only expand and multiply scenarios without the closure that direct observation and measurement provides.

The fifteen (15) comments on "Laser Tattoo" that employ analogies place the laser tattoo machine on a continuum from real to hypothetical machines. The graph below represents the machines that Hackaday.com participants view as relevant to conversation about latent risks of laser tattoos (see Graph 1). The left side of the graph represents machines that are known to exist and have been mass-marketed in America. Toward the midpoint, participants compare the laser tattoo to apocryphal machines such as DIY tattoos and shop laser accidents (<Wolf>, <HE3r0>, <david henderson>, <q branch>). These scenarios are possible but may or may not have occurred (the Hackaday.com participants liberally introduce and talk about fictional scenarios; "Dirk's Accident" illustrates this point). At the right end of the graph, participants compare the laser tattoo machine to machines that do not exist now, but may exist in the future (<matt>, <usblegend>). At extreme right, the future of tattoos blends with science fiction as the participants compare the laser tattoo machine to a futuristic tattoo machine in the

film "Starship Troopers" (<emilio>, <troy nall>).
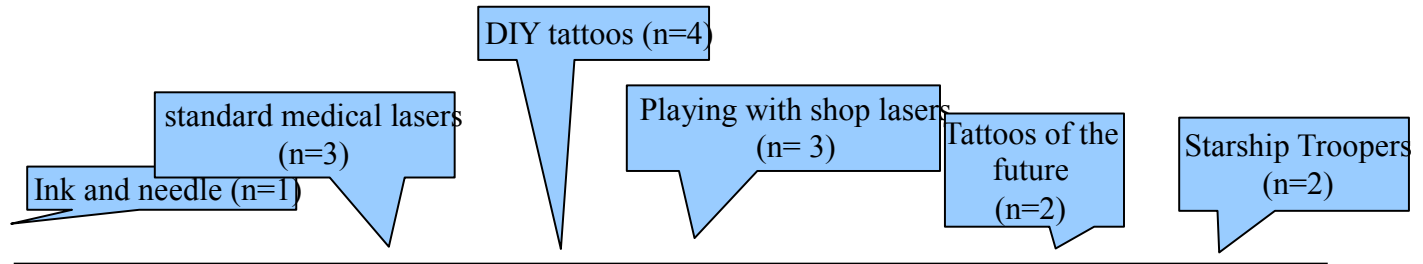
Figure 5: Continuum of Novelty for the "Laser Tattoo" Hack.

In addition to revealing the range of comparisons the Hackaday.com participants employ to understand the laser tattoo machine, the numbers in the above graph also illustrate broad trends in the nature of the comparison(listed as n on the graph). Here, simple counting reveals an interesting trend: Hackaday.com participants do not attempt to understand the "laser tattoo" machine through known and mass-marketed machines such as ink-and-needle tattoos or medical lasers (n=4). Instead, participants employ analogies to apocryphal scenarios that cannot be verified. Whether futuristic or merely personal, these scenarios are just as remote and inaccessible to observation as the machine itself:

> Anyone who works with lasers has done this on purpose or accident. I have worked with lasers for years and when we are bored we will burn a design or two on our hands. it only burns the epidermis layer of skin on the hand if the power settings are correct. Depending on the depth of the burn, it can last for a few days to a week. (<wetsmellydog, 7.7.2008)

Even if <wetsmellydog> is telling the truth about lasers, his personal account can be verified only by a small proportion of Hackaday.com participants: "Anyone who has

worked with lasers…" Further, we must rely on layman <wetsmellydog>'s medical assessment of the damage ("it only burns the epidermis layer of skin on the hand") and on his memory of the duration. Furthermore, <wetsmellydog> hedges his account with an important qualifier ("If the power settings are correct"); of course, <wetsmellydog> provides no further specifications concerning the power settings.   Ultimately, <wetsmellydog> posits an unsupported correlation: the risk of damage from laser tattoos directly correlates with "power settings" on the machine; the risk can therefore be controlled by controlling the settings on the machine. If <websmellydog> offered numerical specifications for the power settings or triangulated his account with pictures or studies, we might call this contribution calculative. But <wetsmellydog> modestly poses his claims as mere personal experience and reflection.   In the end, all <wetsmellydog> has done is place the "laser tattoo" in the context of a human problem: workplace boredom.

Unpacked, <wetsmellydog>'s brief comment is representative of the analogies participants use to understand the laser tattoo machine: analogous situations, analogous machines, and analogous injuries.   Rather than arrive at scientific conclusions these analogies evade science, eschewing medical or workplace reports of laser injuries in favor of science fiction and personal testimony. This comment is an exemplar of the meditative nature of analogies to the laser tattoo machine.   Taken as an isolated set, these analogies can do nothing but plot out possibilities. However, as shown below, these analogies overlap with a web of hazards that converge upon organ damage, dismemberment and death. The latent risks thread may be unable to make concrete recommendations, but it does foreground what is at stake for those who use

the machine.

Having plotted out analogies that help participants understand the laser tattoo machine, the participants work from these analogies to articulate the range of possible risks involved. Again, direct assessment of the risks is impossible. To indirectly assess the risks of using the laser tattoo machine, the Hackaday.com readers employ two more rhetorical devices: understatement and hyperbole.   In other words, the readers simply try out varying ways of expressing the machine's risk, ranging from understatements to hyperbolic exaggerations.   This continuum of understatement to hyperbole is represented in the graph below (see Figure 2). The left side of the graph represents maximum understatement; in these comments, participants claim that <tetranitrate>'s hack is even safer than traditional ink-and-needle tattoos (<Malikaii>).

<Malikaii>'s post is an outlier; other participants articulate a range of safety concerns. For example, pain and burns are known risks but participants largely consider these risks acceptable:

> I bet the first people to see an ink and needle tattoo expressed the same ridiculous reactions. Once something is repeated enough it becomes normal. (<malikaii>, 4.26.2010)

These risks are acceptable to participants only inasmuch as they are temporary. The question "So, is it permanent or no?" (rasz) echoes through the thread, and permanent scars are a frequently identified risk (n=10). But the conversation does not center completely on these modest risks. Occupying a substantial proportion of posts (n=9) are the participants' hyperbolic worst-case-scenarios such as   permanent scars, dismemberment, cancer and eventual death (see, for example, <kab0upas>, <Singh>,

<Frank> and <Q branch>). These posts draw on hyperbole and emphasis to illustrate the worst-case consequences of laser tattoos:

It CAN produce cancer because it's a burn. No matter the type of laser, if you DESTROY the protection against UV (from sunlight, not the laser itself), exposed BURNED AND THEREFORE UNPROTECTED skin absorbs the UV, even in cloudy days. Why I know this? Because a friend had severe electrical burns, and the doctor ORDERED him to use very high factor sun protection AND DO NOT sunbath in a year. This, after the burned skin were apparently healed. And, amateurish use of industrial lasers can too easily burn something more than the three existing skin capes. Just think of the recent incident in Russia, they damaged PERMANENTLY the eyes of 30 youngsters in a party with a RECREATIVE laser. But hey, if it looks cool, what's the matter if the arm drops by itself in a couple years? (<Frank, 6.17.2008)

Taken together, comments that directly address latent risks employ understatement and hyperbole to place the machine on a continuum of safety to danger. Instead of closing in on one risk assessment, a range of perspectives on the risk of laser tattoos proliferates(see Graph 2). Hackaday.com readers do not even attempt to converge on a unified assessment of the machine's latent risks. Instead, multiple scenarios co-exist in the conversation.   Of course, many forms of interactive communication on the Worldwide Web allow multiple scenarios to proliferate; what is interesting about Hackaday.com is that these multiple scenarios are allowed to coexist in the conversation undisputed. The Hackaday.com readers are more interested in generating multiple scenarios than in converging on one.

Permanent scar (n=10)

Pain / burns
(n=9)

Organ damage (cancer or dismemberment)
(n= 9)

Less dangerous than traditional tattoos (n=2)

Death (n=1)
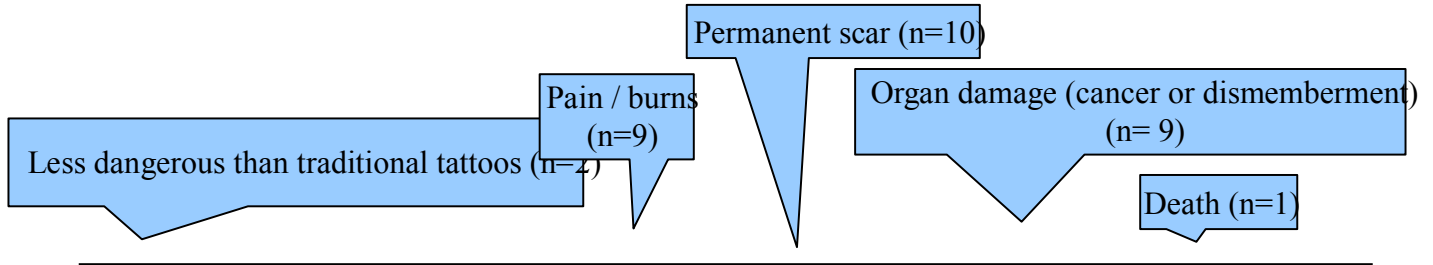
Figure 6: Continuum of Danger for the "Laser Tattoo" Hack

Ultimately, how user-centered is "Laser Tattoo"? As for the original laser tattoo machine, its thrill comes not from technical aspects of the design but from the pain and "burnination" it can inflict on the user's hand. After the redness subsides, what follows from this machine is not replicas or mods but discourse – specifically, discourse about use on Hackaday.com. This discourse constitutes two interwoven threads, each of which leads to a substantially different telos or endpoint(s). If we follow the FDA approval thread, the laser tattoo machine will ultimately circumvent FDA regulations that were designed to protect users from hazards more serious than the superficial burns caused by this laser. While the machine cannot be deployed intact, it can be sold as kits requiring assembly by the hand of the user – the same hand that the machine will burn. If we follow the latent risks thread, the hazards multiply. With each analogy used to understand the laser tattoo machine, new potential hazards are introduced; because no hazards can be excluded through direct observation, the machine becomes infinitely hazardous. It is not possible to prevent users from deploying the machine or protect them from consequences. However, it is possible to illustrate that the telos of the machine is unknown, unstable and poses hazards beyond which the users' hands can

control. According to the "latent risks" thread, injury inflicted on the user's hand can reverberate through space and time and impact the user's entire body – a principle of meditative thinking further illustrated by "Dirk's Accident", below.

Analysis of "Dirk's Accident"

Contributed by <Caleb Kraft> "Dirk's accident" documents the "removal of a fingernail by giant freaking magnets" (par. 1). <Caleb Kraft>'s write-up opens with a link to Dirk's original blog post about the injury. An image of Dirk's X-ray, also borrowed from Dirk's blog, serves as further proof of the injury (see Illustration 5). As shown below, this image includes an X-ray of the index finger and a close-up of the fingernail. On the close-up, the injury (broken bone and bone fragments) is clearly labeled; presumably, these labels were added by <Caleb Kraft>.

According to Kraft's write-up, original hacker <Dirk> sustained this injury while handling powerful neodymium magnets "even though he was really, really careful" (par. 1). As <Caleb Kraft> explains:

> Somehow two of them ended up close enough to attract each other. After a brief flight, the two collided with his finger tip in between them. It is probably still there now.(par.1)

Although Kraft does not explain why Dirk was handling the magnets, he mentions that Dirk "likes to collect odd things"; furthermore, neodymium magnets are useful for a range of hacking projects such as "building wind turbines". A final link to a "homebrew" wind turbine project on Hackaday.com illustrates one way the magnets may be used.

The reader comments separate into two threads: the calculative thread, which focuses on quantifying Dirk's injury, and the meditative thread, which focuses on magnet stories.
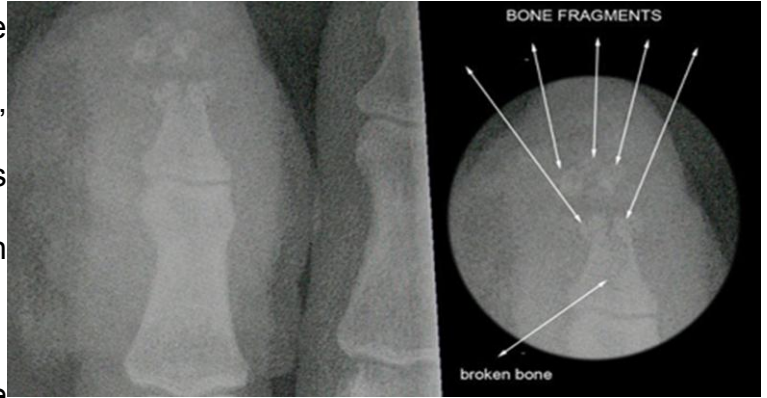
Quantifying Dirk's Accident: Calculative

Figure 7: Dirk's X-Ray

thinking on Hackaday.com

Five of 56 posts on the Dirk's Accident thread employ calculative reasoning. The calculative thread on Dirk's accident literally attempts to calculate -- quantify -- Dirk's accident. Instead of directly interacting with Dirk by posing questions to him in the comments section, readers attempt to quantify Dirk's subjective experience of pain using concepts and formulas from the discipline of physics.

This effort to quantify Dirk's experience is spearheaded by Jay, who announces, "I just calculated the force ratio and physics for the event" (2.18.2009). Jay then presents presents and solves a three-line story problem:

just calculated the force ratio and physics on this event…here it is.

Approximate weight of the flying Magnet: 2Kg

At the impact point there was a maximum speed of 70meters per second with an impact force of 4905 Newtons (<Jarhead Jay>, 2.18.2009). Jay concludes that this impact force "can kill about anything", signing off "Enjoy!". A follow-up posts translates these numbers from metric to English units for "the common people" (2.18.2009).

Following Jay's post, reader <Ross Maclean> further explores the physics of Dirk's accident. Translating newtons to kilogram-force, <Ross Maclean> concludes

"that impact was like having half a ton sitting on your finger" (2.19.2009); the fact that such a small weight "can become a 500kg weight" is "amazing" (2.19.2009). Again, this calculation attempts to quantify Dirk's subjective experience of pain -- a major theme of this thread.   Other readers employ practical physics to illustrate ways to lessen the pulling force of the magnet on human skin. For example, reader <fuzvulf> notes that in the industrial lab where he works, the lab protocol is to dip the magnets in liquid rubber (2.19.2009). This lessens the force of impact, although it is not clear from <fuzvulf>'s post whether or not the rubber-dipped magnets are any less painful.

Taken together, these calculative posts serve two functions: calculating the physics of Dirk's injury, which brings the "voodoo" of the magnet's pulling force within the control of modern science, and facilitating other magnet experiments through simple, fast safety protocols.   From the perspective of the calculative thread, the neodymium magnets should be easy to control. If the user is aware of simple physics principles, and follows simple protocols, no magnet accidents should occur. Conversely, when an accident like Dirk's occurs, the problem is due to human user error and not attributable to the magnet itself.

From Trolls to Tall Tales: Meditative thinking about Dirk's Accident

Just as the "Laser Tattoo" thread centers on the theme of latent risks, the meditative thread I identified on "Dirk's Accident" centers on one theme: readers' personal experiences with neodymium magnet injuries.   Previously, the calculative thread analyzed above explored the objective dimension of Dirk's accident -- the accident in numbers. The meditative thread discussed here explores the subjective dimension of magnet accidents: the sensations, emotions and reasoning that human

beings experience at the moment of a magnet accident. And, just as the calculative thread conveys the objective dimension of Dirk's accident in *equations*, the meditative thread conveys subjective information through a specific type of discourse: stories.

At the opening of the comments section where readers begin sharing magnet stories, the conversation exhibits a marked shift from public to personal space. In Philips' original write-up, magnet accidents are primarily an industrial hazard set in large-scale projects such as "building a wind turbine" (par. 3) , treated in emergency rooms and photographed by X-ray machines. Magnet accidents take place in a site that coincides with the context of traditional technical communication: industry. Then, in the reader comments, the conversation shifts the site of magnet accidents from industrial sites to personal ones: living rooms, personal computers and even the human body (see below). As reader <compukidmike>'s post illustrates, these accidents differ from Dirk's in site and scale:

> All I can say is wow! I've had my finger get in the way of some hard drive magnets and it hurt for a while but this is insane! (they were from a 10 platter SCSI drive and are about 1″x2″x1/2″ thick, so good size for a hard drive) Kudos on having the biggest, scariest magnets I've ever seen! (<compukidmike>, 2.18.2009)

Above, <compukidmike> offers a personal experience with magnet accident; <compukidmike>'s accident takes place on a personal computer, presumably at home, and on a smaller scale than Dirk's. For this, Dirk receives "kudos"; his magnets are bigger.

But therein lays the problem. Although the conversation has shifted to readers'

personal experiences, it has not necessarily become user-centered in Johnson's sense of the term. Even as Hackaday.com readers attempt to shift from an objective view of magnet accidents based on mathematical calculations to a subjective one based on stories about personal experiences in personal sites, narrators of these magnet stories begin to attribute special powers to the magnets themselves:

> I can't imagine the secret Invisible force of 700lbs pulling force.. this kind of voodoo reminds me of dark matter.. it's almost Unfathomable that this is real ;P thank you for creating another thing to fear…. (<kyle007>, 2.18.2009).

Reader <kyle007>'s post is more than simple hyperbole. As readers attribute more agency to the magnets, users become not "empowered" technological actors but also passive victims of powers that the user has unwittingly unleashed:

> I've taken the magnets out of a lot of Hard drives and those are a fraction of the size of those and they are still able to snap to together and make you bleed.(t0ny, 2.18.2009)

These paradoxical themes of empowerment and powerlessness are echoed throughout the magnet stories thread. To neutralize their force, the magnets must be stored "individually in wooden crates" or dipped in liquid rubber (<rivetgeek>, 2.18.2009; <pseudonymous>, 2.19.2009). Once handled, the magnets spring to life "with great force" equivalent to "tossing lit sticks of dynamite", the magnets may injure the human hand that activated them and, in summary, "can kill just about anything" (<Jay>, 2.18.2009). Although the readers of the magnet stories thread have at this point turned away from traditional technical communication to more "extra-institutional" forms such as autobiographical storytelling, their magnet-centered technical communication is arguably *less* user-centered here-- not more so.

It is perhaps only among the extreme outliers -- the trolls -- that the magnet stories once again become user-centered. *Trolls* or internet trolls are readers who post outlandish comments with the goal of disrupting the flow of a conversation; the term *troll* also refers to the posts themselves. Assuming that it is impossible to definitively know the reader's intention, "troll" is a subjective term, although outlandish posts are recognized as trolls and flagged for moderation. Within the magnet stories thread, the trolls present the most complex and provocative view of the magnet – human relationship:

Reader <fuzzmanmatt>'s troll (quoted in its entirety below) certainly presents the human user as a victim:

> I've done this with those small magnets that United Nuclear sells, only on my penis. I almost passed out from the pain, and caused some nasty bruising in the process. Had to use two guys and a pair of pliers to get them off. I've never felt more pain than that in my life, and I'll never play with those magnets again. (<fuzzmanmatt>, 2.18.2009.

However, <fuzzmanmatt>'s story is so outlandish -- and his description of his pain so dramatic -- that the focus of the conversation returns to the user: <fuzzmanmatt>. All of the subsequent posts address not the magnets and their powers but <fuzzmanmatt>'s subjective experiences. Readers' direct questions to <fuzzmanmatt> are arguably even an unlikely instance of user-centered technical communication: "what was your thought process that led to this event?" (wtf, 2.19.2009) -- "what were you thinking?"-- and why are as many as "two people in one thread" telling these "incredible" magnet-on-penis stories (dan, 2.19.2009)? Readers then respond with user scenarios (some plausible, some not) that may have led to <fuzzmanmatt>'s magnet accident. Arguably, reader <fuzzmanmatt>'s troll has shifted the conversation in a user-centered direction.

But true to the informal protocol for trolls as hit-and-run derailers of online conversations, reader <fuzzmanmatt> does not return to answer questions or further explicate his outlandish story. Without further participation from <fuzzmanmatt>, other readers must extrapolate the details of the (possibly fictional) magnet-penis collision event. Fortunately, readers are soon aided by a corroboration of <fuzzmanmatt>'s story – this time , with a level of detail and description that was absent from <fuzzmanmatt>'s original account. Once reader <Pseudonymous> enters the conversation, <fuzzmanmatt>'s magnet story is no longer unique:

> Wow, somebody else who's had magnets stuck on their penis! (<pseudonymous>, 2.19.2009)

However, unlike <fuzmanmatt>, <pseudonymous> elaborates on the technical details of his accident. What emerges is not so much a troll as a technological tall tale, or an unbelievable story related with the solemnity and detail of a true one*:*

> They were the little round ones used for weak magnetic earrings, maybe 5mmx1mm. Almost no force to speak of until you get them 5mm apart from each other. (<pseudonymous>)

Like the calculative thread, <pseudonymous>'s story includes quantitative data: "5mm apart", "2mm thick to about ½ mm thick", "about a pound of pressure". If anything, <pseudonymous>'s calculations are even more complete than those in the calculative thread. Further, <pseudonymous> complements his numbers with anatomically correct details; the magnets snag and compress the "perineal raphe", a loose fold of skin that causes the magnets to disappear:

It was fun. Until you discover that the very top of the perineal raphe, right below the corona, is a fold of skin with lots of nerve endings and no fat – so it compresses from about 2mm thick to about 1/2mm thick under any force, and with a magnet that packs about a pound of pressure into a tiny package at that distance, it pulls the skin around so hard, and makes it so swollen, that it almost gets lost.

Above, <pseudonymous> introduces the magnets to an unlikely collaborator: human skin. This collaborator lends the magnets a new power: they can disappear (become "lost") . Once invisible to the human eye, magnets have dominated their human victim, who cannot seek "help" without facing humiliation:

It took me an hour of suppressing screams, pushing them apart off only to have them snap back again, and wondering how I'd ever live with myself if I sought help

If <pseudonymous>'s tall tale had ended here, it would be merely another testimony to the magnets' awesome power. But even as he describes the formidable magnet – skin collaboration, <pseudonymous> interweaves this information with some subjective detail; the experiment was "fun" (a human-driven exploration of magnets) until the magnets gained the upper hand; the narrator appeared calm but was "suppressing screams" and forecasting subjective humiliation as a consequence of seeking "help". Certainly, previous comments on "Dirk's Accident" do acknowledge the pain dimension of magnet accidents, but <pseudonymous> provides a substantially richer subjective account including enjoyment, self-control and the anticipation of future psychological pain. But although <pseudonymous> is a rounder character than the magnets' previous

victims, at this point in the story he remains a victim.

Taken together, all these magnet accident stories represent more than

But the fight is not over. Ultimately, <pseudonymous> engineers a reversal of fortune by recasting his technological tall tale as a battle of will. The magnets are unrelenting in their "force", but <pseudonymous> possesses a psychological power the magnets do not: determination:

before I finally got it off. Part of the problem with needle nose pliers was that whenever they got close, they rapidly gained force and stabbed me. There is really nothing you can do to get leverage on both sides in order to control the pliers without piercing yourself by squeezing the magnets together. I'm reasonably sure if I'd stopped trying for a few hours I would have a permanent piercing there.

Although the magnets technically overpower <pseudonymous> and his tools (the pliers), <pseudonymous> asserts his will because he is determined to succeed. Facing the twin specters of humiliation and permanent damage, pseudonymous outwits the magnets by "trying for a few hours". Whether or not this account is true, <pseudonymous> has fleshed out the concept of the user in the human-magnet encounter. Certainly, technologies such as neodymium magnets possess "things you can't foresee" (<pseudonymous>). Following <pseudonymous>'s story, these "things" are the technology's latent potentials; the original point of "Dirk's Accident" is that magnets may run amok and endanger the human lifeworld. But, no longer a victim, the now empowered human user possesses psychological forces that can spar with technology and emerge victorious: curiosity, will and "the power of anonymity"

(<pseudonymous).

Taken together, these magnet-accident stories – including <Dirk>'s – represent more than trivial injuries to body parts that users sustain while working with magnets. Returning to Heidegger's "Memorial Address", the magnet stories quoted here reveal "the power concealed in modern technology", which "determines the relation of man to that which exists" (p. 50). Of course, Heidegger is speaking of the atomic age – but the dangers he identifies are easily extended to neodymium magnets. The participants' calculations of the magnets' force illustrate that the magnets are "gigantic sources of power"; they permit the creation of modern technologies such as wind turbines, magnetic resonance imaging (MRI), hybrid vehicles and hard disks. In turn, these technologies "set free new energies" in nature (Heidegger, p. 50) by emitting a magnetic field that permeates and may endanger the surrounding environment (see, for example, magnetscience.com/prius.html). To again borrow Heidegger's language, the "procurement" of these magnets is "no longer tied to certain countries and continents" (Heidegger, p. 51). As the anecdotes and shopping links that are freely exchanged on "Dirk's Accident" suggest, anyone can buy neodymium magnets and "build … power stations anywhere on earth" (Heidegger, p. 50).

All these hazards threaten to endanger the human users of magnets in the context of end use – and, ultimately, the comments on "Dirk's Accident represent user concepts in evolution. At the beginning of "Dirk's Accident", powerful magnets transform human users into victims. As a calculative thread at the beginning of the reader comments illustrates, the human – magnet interaction is at first glance no-contest fight. In quantitative terms, magnets overpower humans. As the reader comments evolve,

participants / victims join the conversation to share their stories about magnet accidents. These accidents primarily occur in a range of settings from institutional sites (labs, windmills) to extra-institutional ones (hacking and mod projects). However, whether the site is institutional or extra-institutional, the user concept is the same: users are unwitting victims of the "sheer force" of powerful magnets. When it comes to user concepts, there is nothing inherently radical about hackers.

But "Dirk's Accident" possesses user-centered potential. Just as the magnets spontaneously transformed users into victims, technical communication about magnets spontaneously transforms victims into users. On "Dirk's Accident", this transformation is initiated by an unlikely outlier – a troll. While troll <fuzzmanmatt>'s original intention may not have been to initiate a user-centered dialogue, he shifts the conversation to the most private of personal sites – the genitals, a symbol of humanity and power. Here, the magnets' attack becomes personal. Not to be eviscerated by mere magnets, one human user (<pseudonymous>) re-invests his energy in defeating the magnets and reclaiming his manhood through uniquely human psychological powers.

Again, it does not matter whether <pseudonymous>' story is factually true: <pseudonymous>'s contribution is a rehabilitation of user concepts and a representation of empowered users. For ordinary users, the power of language remains subordinate to the constraints of physics and truth. But when the reader steps out of the empowered role of hacker and become a troll, something else happens: free from the real-world conditions of physics and the constraints of truth, the user becomes the architect of magnet stories, spinning dramatic tales that draw the reader's attention to user-centered concerns.

Of course, this symbolic empowerment engenders further problems. <Pseudonymous>'s victory is phallo(go)centric in the extreme, centering on the penis, masculine stereotypes (<pseudonymous> refuses to go to the doctor or seek "help") and fatherhood ("Geek Dads"). Even as "Dirk's Accident" becomes user-centered, it does so by delimiting the user concept to male users. In theory, female users may not overpower the magnets in precisely this way, and their different ways of overpowering the magnets may not be recognized by Hackaday.com participants as power. I further explore user concepts in women's' extra-institutional technical communication in Chapter 3.

Conclusion

Technitation: A Means of Expanding User Concepts in Extra-Institutional Technical Communication

Is extra-institutional technical communication necessarily more user-centered than the traditional forms of documentation employed by industry? As the above analysis of technical communication on Hackaday.com suggests, the answer to this question is not so simple. On one hand, ideas about telos -- use -- certainly are a central focus of technical communication in extra-institutional sites. This contrasts with traditional technical communication's focus on materials and techniques; if anything, extra-institutional technical communication is more user *-focused* than traditional forms of documentation. However, as the above analysis suggests, not all of these ideas about users are user-centered. For the readers of "Laser Tattoo", making the machine more accessible to users means circumventing FDA safety regulations; for the readers of "Dirk's Accident", users' subjective experience -- although a focus of conversation --

is represented in numbers and equations.

Alongside these calculative threads that reduce laser safety to "foolish" regulations and human users to numbers, other ideas about users proliferate. These *meditative* threads ingeniously circumvent constraints ordinarily placed on users: users' remoteness from sites of technological development and even constraints posed by the laws of physics. In these threads, users employ unconventional technical communication techniques to regain control over the rhetoric of use scenarios.

It is within these meditative threads that we see features not present in traditional technical communication begin to emerge. For the two hacks analyzed in this chapter ("Laser Tattoo" and "Dirk's Accident"), meditative thinking played a prominent role in generating new forms of technical communication – forms that appear to be unique to extra-institutional settings. When Heidegger proposed meditative thinking about technology, he envisioned this as a philosophical activity – not a new component of technical communication. To capture my unique finding of meditative thinking within extra-institutional technical communication environments, I introduce the term *technitation t*o refer to meditative thinking that occurs in the context of technical communication. Far from a delimited set of discursive features, technitation is a broadly defined mode of inquiry that explores the unmanifest dimension of technology. Calculative thinking is grounded in direct observation of technology; it calculates and quantifies what has been directly observed. Contrastively, meditative thinking is an indirect approach; often located in remote sites (and away from the grounding constraints of observable reality), it relies on unlikely technical communication methods: analogies, hyperbole and tall tales enable users to explore the realm of

technological possibilities – and their consequences for the user's lifeworld. For "Laser Tattoo", similes and hyperboles allow users to probe unseen risks inherent in laser tattoos; for "Dirk's Accident", tall tales discover an unlikely bastion of human resistance to magnets: psychological power.   Of course, these ways of exploring technology are hardly new; by themselves, they would be science fiction. It is their existence alongside traditional, calculative forms of technical communication that allows user-centered technical communication to emerge in extra-institutional sites.

Technitation is further explored in Chapter 4, where I analyze technological production on extra-institutional sites.

CHAPTER 3

Introduction: What's Practical About Invisible Wigs?

To return to my broad research question, "What do extra-institutional technical communicators do?", the analysis of the Hackaday.com site in Chapter 2 illustrates that traditional (male, white and young) hackers are primarily engaged not in building artifacts but in constructing hacker culture by thinking meditatively about the meaning of hacks and artifacts. As Douglas Thomas predicts, aspects of boy culture are grafted on to the virtual culture of Hackaday.com: superiority to other participants, independence from inferior sites, testing the boundaries of the Hackaday mods and "general dissatisfaction" with mainstream computer culture (see Thomas, p x-xi). However, these male, white and young hackers do not represent *all* of extra-institutional technical communication, and it would be unfair to generalize these findings to writers from all demographic and cultural backgrounds. Therefore, Chapter 3 extends our understanding of extra-institutional technical communicators' activities by examining a novel group of extra-institutional technical communicators: the Lace Fronts forum of Blackhairmedia.com. Whereas the Hackaday.com participants in the previous chapter, like those studied by Thomas, Feenberg, Galloway and Kimball, are young (46%), white (78%) men (83%), the Lace Fronts forum members are young (47%), Black and (84%) predominately female (g77%). By studying the activities and communication of the Lace Fronts forum members, I hope to show that extra-institutional technical communication is not exclusively dominated by boy culture, and to extend our awareness of the cultures and communication styles that make up extra-institutional technical communication.

As we saw in the previous chapter on hacks and hackers, *techne* – making – dominated technical communication on the Hackaday.com site. This *techne*-dominance correlates with a specific theoretical perspective on technical communication: the view of technical communication as *techne* (see Johnson, Ranney). However, since the inception of technical communication theory, a competing view of technical communication has rivaled *techne*: technical communication as practical action or praxis. According to this view of technical communication, the type of reasoning associated with practical action is prudence or *phronesis*.

This alternative view of technical communication as praxis is commonly associated with Miller's (1979) seminal essay, "What's practical about technical writing?". In brief, Miller argues for a view of technical communication that "emphasizes action over knowledge and production" (p. 22). Of course, Miller is not arguing that technical communicators should strive indiscriminately for *any* action or for actions that are merely profitable (Miller refers to this baser view of action as the "low sense of practical"). Instead, Miller specifically advocates good actions that "maintain the life of the community" as a whole – not just the corporation (p. 15). According to Miller, *techne* aims for what is useful; *phronesis*, for what is good (p. 22). Since Miller's seminal (1989) essay, this concept of technical communication as practical action has been taken up by many contemporary technical communication scholars to address problems such as academic-industry partnerships. Whether a scholar employs *techne* or *phronesis* as a theoretical framework, these terms are generally posed as a mutually exclusive either-or choice: either technical communication is best theorized as *techne*, or *phronesis* is a better guiding concept for our field. And perhaps traditional technical

communication in academia and industry is best described and guided by one central theoretical concept. However, as this dissertation illustrates, extra-institutional technical communication is not so simple: techne may dominate one site and phronesis another, or both approaches may co-exist side-by-side within a single site or even within one thread.

Certainly, the goal of maintaining the "life of the community" did not figure prominently into the Hackaday.com users' view of technical communication. These users talked mostly about building technology, and very little about building community ethics and policies. Certain features of the Hackaday.com blog itself seem to mandate this lack of community life. When users post anonymously and user comments are somewhat limited to topics introduced by the contributors, there is little opportunity for talk about what's best for the Hackaday.com community or the broader community of hackers. Even when contributors do introduce community policies, these decisions are unilaterally handed down by the contributors there is not much for the community to talk (i.e., deliberate) about. It is not surprising, then, that Hackaday.com user produce technical communication that only calculates and, more interestingly, meditates about the technological topics.

For this chapter, I complement the analysis of techne-dominant Hacakday.com with an analysis of a praxis – dominant extra-institutional site: Blackhairmedia.com, a popular online site for African-American hair care. Specifically I analyze the forum section of Blackhairmedia.com, where users (mostly women) share and discuss an impressive range of hair styling techniques. This chapter focuses specifically on the lace fronts forum, which deals with the technically (and socially) complex problem of

making wigs invisible.

"The Secret Is Out": Description of Blackhairmedia.com and the Lace Fronts forum

On the surface, praxis – in Miller's sense of maintaining community life – is an inherent *a priori* feature of Blackhairmedia.com. Billing itself as "The #1 Online Source for Hair Care and Beauty Information for Women of Color", Blackhairmedia.com explicitly aims to promote healthy hair styling practices – and, by extension, healthy nutrition, skin care, relationships and spirituality. Although Black Hair Media provides some content in the form of articles, blogs and contests, most of the content is generated by the 100,000 monthly users who visit the site and post on the forums. These forums are the main hub of activity on BHM: most (39K) of the 51k monthly visitors to BHM visit the forums (Quantcast). Importantly, this user-generated content also generates revenue; advertisements are strategically positioned in every area of the forums, and the owners of Blackhairmedia.com collect ad revenue from incidental traffic to the ads from the forums. In a sense, the users are Blackhairmedia.com's unpaid technical writers – users generate the content that attracts traffic to the site, but do not receive paybacks from ad revenue.

This chapter focuses on the most popular forum on Blackhairmedia.com: the lace fronts forum, which generates a massive amount of talk about a closely guarded hair extension "secret" (see <rjohnson42u>, "The secret is out!", 3.11.2010): lace front wigs. In brief, lace front wigs are invisible hair pieces that originated in the film industry and have become popular with predominately African-American female consumers. Unlike traditional wigs and weaves (which are made or installed by professionals), lace front wigs demand an expert user who can modify and self-apply

the wig and then touch up the application on a daily basis in order to avoid its detection. This invisible wig application cannot be taught by manufacturer instructions; it must be individually learned through practice of application techniques that harmonize with one's skin chemistry, activities (such as workouts). The Blackhairmedia.com lace fronts forum is a rare node of connection for these secret wig wearers, placing members in community with other wearers who are working on the same problems.

But secrecy and community are conflicting goals. Because their communication centers upon an inherently secretive technology – invisible wigs – stealth is the first objective of all communication on the lace fronts forum. Here, technical communication on the forum presents a unique problem to members ; if information about how the wigs are worn is publicized to search engines, the secret may be discovered – or worse, the wigs may become popular enough to be mass-marketed, exposing the secret to the light of advertising. So, the lace fronts forum serves dual and sometimes conflicting purposes: disseminating information to insiders and protecting the "secret" from outsiders. To navigate these conflicting goals, members play the innumerable information games outlined below; only members who understand the rules enough to participate in "the game" can obtain coveted information about lace wigs. These information games depend on two distinctions: the distinction between "Newbies" and "Vets" and the boundary that distances the lace fronts forum from the rest of Blackhairmedia.com and its goals:

"Newbies" and "Vets"

From these dual purposes, two groups emerge: long-term insiders or "vets", who may participate in the exchange of coveted information about lace front wigs, and

outsiders or "newbies", who are broadly excluded from participation in many conversations on the forum. Members of the lace fronts forum pervasively employ the terms "vet" and newbie; see "I am not a vet" for a philosophical discussion of these terms on the lace fronts forum (<nufsayd>, 6.25.2010) These distinctions are rigorously *practiced* by forum members, who employ special communication strategies to share or withhold information. Information about lace wigs is hidden in plain sight, and members talk in code, fragment information and hide information deeply within multiple archived threads to prevent outsiders from obtaining information. Occasionally, specific members are actively excluded from participation, flamed or ignored; this treatment is notoriously inflicted on naïve "newbies" who post questions that belie their lack of expertise (see, for example, "Shandra's Pms", 7.7.2010). These strategies allow insiders to trade information among themselves, while keeping the same information from persons viewed as outsiders.

But who is a "newbie" and who is a "vet"? On the lace fronts forum, the insider-outsider boundary is fluid; members may be welcomed as "vets" in some threads and excluded as "newbies" from others. For example, "newbies" may not be permitted to post naïve or repetitive questions on the forum, but can post pictures of a first-time wig application and receive constructive criticism. The insider-outsider distinction also elides a range of real-world demographic categories that are represented on the forum. Although Blackhairmedia.com is explicitly designed for Black women, the demographic profile of actual users is surprisingly diverse.   As many as 33% of visitors to the forums are male, and at least 15% self-identify with ethnic categories other than Black. Also present on the forum are Chinese vendors, who sell cheap lace front wigs

directly to forum members wishing to circumvent the high-end American market. These diverse forum demographics are themselves a frequent topic of discussion (see "The Demographics of BHM", <Maple Syrup>, 7.1.2009), and the members strive to use inclusive language and avoid slurs, insults and stereotypes directed at Blacks and non-Blacks. For any given thread, members from any of these demographic categories may be classed as insiders or outsiders; both of these classifications depend on the context and the members' experience, not on membership in any demographic category.

The Lace Fronts forum vs Blackhairmedia.com:

In addition to the insider – outsider distinction, which determines who may receive information at any given time, the lace fronts forum also employs another key distinction: the Lace Fronts forum *versus* the rest of Blackhairmedia.com. From the perspective of lace fronts forum members, the lace fronts forum is an exclusive community for users in-the-know; Blackhairmedia,com itself is just a for-profit enterprise that provides the forum space . This distinction is at first apparent in the lace front forum members' frequent critiques of advertising on Blackhairmedia.com; members admonish others that Blackhairmedia.com is not free in any sense of the word. However, nowhere is this distinction more apparent than in the members' and administrators' conflicting two views of the forum's social hierarchy. As illustrated below, these conflicting views pertain to how forum members should be ranked; Blackhairmedia.com admins rank members according to their output, while forum members reject this system and rank each other based on action and experience.

The View from Blackhairmedia.com: Ranking members by output. From the

perspective of the Blackhairmedia.com owners, the hierarchy of the lace fronts forum is exactly the same as that of any other forum on the website. These forums are viewed as technologies that generate content (threads and posts) for profit, and members are ranked according to their output of content in posts. For example, newbies with <50 posts may not start topics but can only post on other threads; as they post, newbies graduate to higher statues such as junior member, platinum member and elite member based on writing output (these limitations are automatically enforced by the forum technology itself). These categories are definite and fixed; one cannot be a junior member on one forum and an elite member on another. With the exception of newbie to junior status, the exact number of posts required to graduate to each category is never publicized; this gives members an incentive to return to the forum often and post as much as they can. Interestingly, in 2011 Blackhairmedia.com supplemented this output-based hierarchy with a new category: writer. To join this category, members may produce "articles" about Black hair care for publication on the site; members wishing to do so earn 25$ to 35$ per article (see "Earn money writing for BHM!", 9.13.2011). In summary, the BHM owners collect revenue on a product that is largely member-generated; members, in turn, are uncompensated or poorly compensated for the content they produce.

The members' view of the lace fronts forum: Privileging experience. The lace fronts forum members reject the BHM admins' attempt to class members by output alone. As member <flawlessone> puts it, "the number of posts you have do not make you a vet" (8.24.2008) – a sentiment echoed by other members on the board, who criticize the output-based system:

People trying to bump themselves up to get to 50 posts, trying to make a thousand posts in a month..... I'm sorry but this bothers me because a lot of times they have   nothing useful to say (<Mscalicky>, 8.24.2008)

Remember you can rack up a number of posts by posting in any section of the   forum...be it TTT or where ever. (<sweetcarib>, 8.24.2008)

Another thing i look at is when they get to Senior member status and have not been on the board that long. case in point (just as a reference) you and I Flawless1, we both are Senior members but you have been here longer than me and with fewer posts   (<MDLFdiva>, 8.24.2008)

From the perspective of the members quoted above, the output-based system is flawed because it values production over quality and seniority, allowing new members to gain status by posting brief or nonsensical comments anywhere on Blackhairmedia.com.

 Perhaps unsurprisingly, members reject this system in favor of an informal hierarchy that is unique to the lace fronts forum alone. .

 Disregarding the official output-based categories, forum members prefer to place one another in an informal hierarchy based on seniority, not output. This informal hierarchy recognizes only 3 categories of members: insiders and outsiders, which are context-dependent and flexible categories as illustrated above, and one fixed category: "vet". Put in terms of Miller's definition of praxis, "vet" status is a form of recognition that "values action over knowledge and production" . Although the members of the lace fronts forum may not be academic scholars in technical communication, Miller's distinctions ring true; "vet" status concerns overall ability to wear the wigs in everyday

life, and not just the technical skill to produce one excellent application:

> not being afraid to talk about your mishaps plus having great apps even though
>
> lf's and adhesive have a mind of their own so even the most experienced vet can
>
> have a bad   app day (<choclatey77, 8.25.2008)
>
> I think to qualify to be a vet you have had to ruin at least three units and bring
>
> them bad boys back to life successfully and tell us how you did it!
>
> (<innovativelace>,   8.24.2008)

As illustrated above, "vet" status privileges experience (i.e., action) above technical excellence. A "vet" wearer can not only produce "great apps" but can cope with "bad app day(s)" and "ruin(ed)" units. "Vet" status not only requires the ability to wear the wigs but also to "uplift" other members of the lace fronts forum with good conduct (A Distinct Edge, 8.25.2008).   "Uplifting", "encouraging" or empowering others is even more important than providing technical information:

> I feel that being patient, and learning all you can will help one to evolve into a vet
>
> at some point and it shouldn't be rushed. Experience is key. I am one who loves
>
> to help others but I will do so only if I know if I can truly help. Sometimes though it
>
> helps to encourage others when you can do nothing else at the time. (<A Distinct
>
> Edge>)

When the "vet" does provide technical information, this information is never presented as a "gospel" or fixed truth that must be followed. A "vet" enables "hands-on experimentation" instead of unilaterally providing tools and techniques:

> A knowledgeable hair wearer or a "hair pro" will never give out misinformation as

the gospel. if you read the post or advice that is given by people like sexi, tooblessed, puppy, or old school members like reality you will notice no one says "YOU HAVE TO DO THIS" it is always information shared from experience meaning they found this to work. (<Charmed>, 8.25.2008)

Of course, not every member so narrowly defines proper "vet" behavior. However, even if the term is employed "loosely", it is used to privilege action ("experience") above knowledge and production. As <rossanew> plainly states, "I simply use the term VET to refer to far more experienced than me" (<rossanew>, 2.25.2010).

On the Lace Fronts forum, these two overlapping structures – the official view of the forum as a for-profit enterprise and the unofficial one of the forum as praxis -- are often in conflict. For example, BHM moderators often move valuable discussions from the lace fronts forum to the "talk" section because the moderators determine these discussions to be off-topic. Similarly, the longtime members recognized as "vets" by Lace Fronts forum members may be banned by BHM moderators for minor infractions (see, for example, "Celie Contact Info?", 11.14.2007 for an in-depth thread critiquing the administrators' controversial decision to ban <Celie>; of course, this thread was moved from the lace fronts forum to the more inconspicuous "talk" section by the administrators).

In summary, the lace fronts forum is an extra-institutional site in that it takes place at a remove from the global hair industry that produces the wigs. Although factories do sometimes include instructions with the wigs, these instructions are not enough – members must learn about the wigs by practicing and through daily communication with other users on a forum that is (at least in theory) unaffiliated with

the wigmaker. But to call the lace fronts forum "extra-institutional" is an over-simplification. Although technical communication on the lace fronts forum is not sanctioned by the wigmakers, it is housed within a for-profit hair care site that earns ad revenue from site traffic, including visits to the lace fronts forum. The wigmakers, in turn, are at least loosely affiliated with Blackhairmedia.com in the sense that they place advertisements for lace wigs on the site, and many wigmakers themselves visits the forum dispensing technical "information" and advertising their own products – although these posts are not always well-received by forum members. And within this high-traffic global agora, lace fronts forum members transmit everyday secrets to each other. Although communication on the lace fronts forum is extra-intuitional, it is not removed from the market nor is it under-determined; insiders, outsiders, lace fronts forum members and BHM-affiliated stakeholders all work to shape technical communication on the forum and members' interactions with the wigs themselves.

Research Methods

This analysis is guided by a central research question about praxis: how do members manage the flow of information on the lace fronts forum to attain the community "good"? As I conducted the analysis, I noted that the lace fronts forum members hold two conflicting goals: sharing information and protecting "the secret" of lace front wigs. These conflicting goals are evident everywhere on the forum, where forum members' direct requests for information intertwine with frequent admonitions to protect "the secret" at all costs. I then assumed that, for the lace fronts forum, the community "good" means keeping these conflicting goals in balance. As illustrated in my description of the site, this drive to protect secrecy while sharing information

engenders two categories: "vets", who may share information, and "newbies", who may not. Because these categories are continually in flux, I do not attempt to assign individual members to these categories for the purposes of this analysis. Instead, I focus my analysis on the strategies that all members employ to manage the flow of information on the forum; these strategies create flexible boundaries that may subsequently be enforced or dismantled later on. When any lace fronts forum member employs a strategy to manage the flow of information on the forum, she (or he) not only obtains information but simultaneously shows off her potential to be a "vet" who works to protect the community's most precious resource: secrets.

Two observations about communication on the lace fronts forum guided my analysis. These observations pertain to members' pervasive concern about revealing and concealing information on the forum. First, members deliberate in general terms about the best approach to handling information on the forum. In Aristotelian terms, these general conversations involve *phronesis*, or knowledge about prudent action. One thread stands out as an exemplar of this type of general deliberation: Member <Sdotkaine>'s thread "Lace wig secrets", which presents an impressively thorough debate about handling information on the forum. Member <Sdotkaine> begins the thread with an impassioned plea to other members to reveal more information on the forum. I have quoted <Sdotkaine>'s post in full to illustrate the extent to which members explicitly discuss revealing and concealing information:

> I have been a member of BHM for the past 5-6 years and one thing that I cannot understand for the life of me is why some ladies join the forum and don't want to help, or answer questions of other members in regard to "Good Vendors".

Are we really so selfish that we don't want the next woman to look just as good as us? I honestly would rather tell another woman how to get her hair game together, than look at her wear a "bad weave/wig". 5 years ago when I first joined, the ladies were more than happy to suggest the best vendors, and help one another, and with every year that passes, I notice that there is less and less camaraderie.

I'm not trying to diss anyone, I just don't get the point of being a part of a forum where the experienced & knowledgeable ladies would rather leave the newbies out in the cold. It puzzles me. 😰😰 (7.31.2011)

Above, <Sdotkaine> attempts to change the established knowledge about action (phronesis) by arguing that the practice of concealing information harms the "camaraderie" of the lace fronts forum as a whole. Of course, a range of differing views exists – and the "Lace Wig Secrets" thread offers one opportunity for members to articulate them:

Honestly I understand both sides (<Stephnyc03>, 7.31.2011)

I for one don't mind saying where I got my wig from. I did a review recently on this forum and I gave up the link I got it from. Why I did it? Because I felt I should since I got so much information from this forum it's unbelievable. (<tyshastx>, 8.1.2011)

However one reason some might be cautious is that if the vendor they suggest does not work out for someone else, the person might blame the member who

made the suggestion or accuse them of being a seller for the vendor, etc. (<Angelsgirl>, 8.18.2011)

While this thread encompasses divergent views, it converges on a compromise: information is present on the forum and newbies are responsible for gathering it through "research":

I did lots of research on this forum and I got many answers. (<Tyshastx>, 8.01.2011)

I have been a member for a year or two... barely post but I have learned to search my butt off around here. a lot of times the vets tell their vendors (at least in the weave forum) just not outright, it's usually in a reply to a thread on page 5 😊 I've learned to even use Google to search this site. It really helps (<Phillli>, 8.19.2011)

What i have learned is RESEARCH RESEARCH RESEARCH a little research goes a long way and someone might be willing to help you more (<MinnieMe>, 9.21.2011)

According to the posts above, information on the forum is hidden in plain sight; newbies who do "research" to uncover information will have a better chance of obtaining help from "vets". Of course, this consensus is temporary; as of 2011, newbies still post questions that have already been asked, and vets continue to ignore them.

In the absence of a consensus about how to handle information, Lace Fronts forum members must rely on more immediate cue that tell members when it is appropriate to reveal or conceal information. In Aristotelian terms, these concealing and revealing cues concern praxis, or prudent action. For example, members may directly

cue others to reveal or conceal information (see "Ashleys mom and other vets get in here quick", 7.23.2011; <honeysweet>, "Synthetic LF wearers get in here!", 10.21,2008; "Jacksun LF wearers get in here!", 8.3.2006). As the thread titles aptly illustrate, these revealing cues usually take the form of direct requests for information from "vets"; responses depend on the member's ability to show that she has already researched other threads on the topic:

> I just wanted to say I have done my homework and am aware the Jerome Russell dries in 15mins so and so does the Sally as I have used that before but never personally used those as a combo. I imagine a tacky hot mess! And endless applications, so to those who use this combo, seems so redundant to me, what do you like about it? As opposed to straight up bleaching? (7.23.2011)

Revealing cues on the lace fronts forum usually follow the above pattern; members directly ask for information from specific members ("get in here") and, if the thread appears to be informed by research, the members reply. Very rarely, members will also direct each other to conceal or hide information on the forum:

> Yes, that topic is like sharing your bra size at the company picnic (<webgurl2000>, 8.20.2011).

> It's my avi pic please don't quote ("Websites for a natural looking lacefront", 11.5.2011)

> Please don't quote! I'll add more later ("Let's represent!", 5.13.2010)

The frequent admonition "don't quote" Is a request not to circulate members' pictures, which are replicated if the a member hits the "quote" button in her reply – as discussed

in the analysis, quoting also makes it impossible for members to remove their own pictures.

However, sometimes the cues to reveal or conceal information are more subtle. As illustrated in the description of "vets", "newbies" view "vets" as teachers or models and follow their example in order to gain "vet" status themselves. Therefore, when a member who is recognized as a "vet" conceals or reveals information, this is often read by "newbies" and other vets as a cue to do the same. These subtler revealing and concealing cues are a recurring feature of the 2009 Hairline Throwdown thread:

> Miss Celie you are too cute! Ladies, those apps are fierce. I might get up the nerve to post mine. (<happy2binformed> 5.23.2009)
>
> there are some serious apps on this thread....I need to tighten up my game a lil' (<tressa>, 5.23.2009)
>
> OMG! I just woke up this morning and saw this post. TEN (10) pages already! Geeeze!!!:: runs off to closet to grab a unit to apply :: (<teafortwo>, 5.24.2009)

Even more subtly, members pattern their posts and pictures after contributions from the vets. "Newbies" will attempt to copy the style of the vets' posts, while "vets" will attempt to outdo each other. For example, when <Asianiis> issues commentary instead of posting another play, she frames this commentary as a pause for refreshments. This image becomes a meme that is echoed by other members who are posting only commentary:

I am so sorry I am late with the refreshments!!!!!It is so hot up in here with THESE PEFECT APPS AND HAIR FLOATING AROUND HERE I know ya'll need to be refreshed... (<Asianiis>, 5.24.2009)

Asianiis, I'll take some of those Nacho Doritos and a glass of pineapple juice, thanks. Your hairline is what's up!!!!!! *Sits back down to take notes* (<Chantal34>, 5.24.2009)

Baileys (<Celie>, 5.24.2009)

Now where is Asianiis with those drinks. I need one to make myself bold enough to ask my man for a LF 😬 can't wait to be a part of the family. (<Aneedtobepretty>, 5.24.2009)

OMG.. Luv you look beautiful... I am so glad I finished my beer before your pictures showed up....ROFL (<Lwhite1960>, 5.25.2009)

Above, member <Asianiis> introduces the "refreshments" and other members improvise on this theme. Far from a mere diversion, this theme provides a way for all members to participate without posting a play and introduces a novel twist to the sometimes commentary (which often consists of simple praise). This patterning and improvisation is also seen in the plays, where "vets" may not only imitate but also try to outdo each other. For example, member <TheSecret> posts a picture of her nape; this is followed by subsequent nape shots by other members who refer to this theme as "Nape-Opolis"; <Lwhite1960> outdoes these post by commenting "I will get forehead-ville started" and posts a play that begins a volley of forehead shots (see <TheSecret> Lwhite1960, <TheSecret> and <Nufsayd>, 6.24.2009). Within these posts, there is no direct call to

post forehead or nape shots; the members' pictures alone serve as cues that tell members what to show (or reveal) in their subsequent responses.

In order to investigate how members manage the flow of information on the forum, I first selected a thread (online conversation) for analysis. Because I am interested in how members actively manage the flow of information on the forum, I chose a (2009) archived thread instead of an active one. Active threads are works in progress; archived threads are final drafts showing revisions and deletions that members have applied to their own writing. Where deletions were made, I consulted the Internet Archives Wayback Machine to track changes and determine what was deleted. Recovering deleted material is not an exact science; I used the Internet Archives and cached webpages to recover deleted material where possible.

The thread I chose for analysis, "So you want a throwdown, do you?" is the most commented-on thread in the 2009 archives. As shown in the many posts cited below, members refer to this thread as the "2009 Hairline Throwdown thread" (or simply the "hairline throwdown") and I use this term throughout my analysis. At 1298 posts, this thread is the longest by a large margin; at 352 posts, the next longest thread is only 36% as long. Therefore, "So you want a throwdown, do you?" represents a large proportion of activity on the lace fronts forum in 2009; analyzing this thread provides valuable information about what happened on the forum in that year. To conduct the analysis, I collected all data from the thread including the posts themselves, any embedded media, internal links to other Blackhairmedia.com threads and external links to other materials. Because the archived material is retrieved by the server and displayed in the same layout as the day's current threads, it is impossible to find and

analyze layout elements such as advertisements that were displayed at the time the thread was generated. Therefore, I ignored layout elements such as advertisements unless members specifically referred to them in their communication.

The data I collected was already segmented it into *posts.* Posts are the single-author entries that make up the basic unit of communication on Blackhairmedia.com. Unlike the Hackaday.com site, Blackhairmedia.com allows members to organize related posts into conversational threads. One member starts a thread with a title and an initial post, and then other members comment on the thread. This board displays threads in chronological order; each thread is indexed under the original author's title.

Once I collected this data, I was positioned to examine how lace fronts forum members managed the flow of information on the 2009 Hairline Throwdown thread. To determine the proportion of revealed information about wig techniques to information about proper conduct, I coded the data through a two-pass process. In my first pass through the data I examined the relative prevalence of *techne* and *phronesis* in the thread. Posts coded as *techne* concerned making or modifying the wigs themselves; I sub-coded these according to the four Aristotelian causes discussed in Chapter 2. The most prevalent subcategory of *techne* was wig application techniques, which I sub-coded as *telos* or end use by the user (application techniques are further discussed in Chapter 4). Posts coded as phronesis concerned prudent conduct while wearing the wigs, including cues to reveal or conceal information. I initially suspected the thread to be *phronesis*-dominant due to the community-oriented ethos of the Blackhairmedia.com site, and simple counting confirmed this suspicion. The findings of this first pass

through the data are detailed in Tables 5 and 6 (see pages 108-109).

As shown in Tables 5 and 6, I divided phronesis into two operationally defined categories that emerged from my data: revealing cues, which are cues to reveal information about lace front wigs, and concealing cues, which are cues to delete or conceal the same information. Again, these sub-categories are not classical constructs pertaining to phronesis; instead, they emerged from my analysis of communication on this particular thread. Taken together, the revealing and concealing cues give (often conflicting) cues about prudent action on the forum and, by calling for discovery or secrecy; members manipulate the flow of information.

However, the numbers listed above only tell part of the story: By analyzing the habits of mind pertaining to *techne* and *phronesis* in the technical communication on the forum, I discovered that the lace fronts forum members are more concerned about prudence than technique – at least within the thread I analyzed. But this raises new

Table 5

Techne on the Lace Fronts Forum

Dimension of techne	
Artisans : Names of vendors, or members who authored specific techniques.	23 posts revealed information about wigmakers, including preferred vendors and information about how to become a wigmaker
Materials: Materials used to make or modify wigs.	148 posts revealed information about wig materials.
Eidos: Forms or templates, such as cap construction or specific wig designs.	72 posts offered partial blueprints for the design of a wig. These ranged from information about vendors' wig templates (called "cap construction" on theforum) to various pictures intended to be used as patterns for wig construction
Telos: Wig application techniques.	56 posts offered information about application techniques, ranging from general comments about what constitutes a good application to specific techniques for applying the wig.

Table 6

Phronesis on the Lace Fronts Forum

Dimension of phronesis	# of posts (629 total posts)
Revealing cues	264 posts contained cues to reveal information about lace wigs.
Concealing cues	126 posts contained cues to conceal information about lace wigs.
Other	189 posts were *neutral continuers* that contained cues to keep the conversation going. These consisted of praise of the posted applications and the thread, or direct calls to keep the conversation going.

Note. Neutral continuers were brief statements such as "oh lookie lookie" (<Lwhite1960>, 5.24.2009) and "Dang y'all still going at it" (<Ilovelife>, 5.24.2009). I also included generalized praise such as "all you ladies are beautiful" in this category (<lattabody>, 5.24.2009).

questions about how members manage the flow of information on the forum: *How* do members tell each other when to reveal or conceal information? What do the revealing and concealing cues look like, how are they structured, and how do lace front forum members work to keep these two conflicting goals in balance?

As I examined my data more closely, a pattern emerged: technical communication

about lace front wigs is mediated by Black Talk; this dialect of American English broadly shapes all of the information games that members of the lace fronts forum play.   In brief, Black Talk is an all-encompassing term that refers to the English used by Black Americans (Smitherman). Other terms for this language include Ebonics, Black English Vernacular (BEV) and African-American Vernacular English (AAVE); I use Smitherman's term because it encompasses whole speech genres (call-and-response, ritual insults, etc.) as well as linguistic features (copula omission, nasalized vowels, etc). Black Talk and its regional variations have been the subject of innumerable linguistic studies; it would be impossible to review all of these studies here. Tables 7 and 8 summarize some features of Black talk as identified by Smitherman and others. This is not a comprehensive list of the genres and linguistic features of this dialect; it covers only the features of Black Talk that figured most prominently into the 2009 Hairline Throwdown thread (see pages X).

These features of Black Talk recurred prominently on the lace fronts forum. Importantly, this use of Black Talk is a rhetorical *choice*; the same member may use Black Talk in some situations and Edited American English in others, or code-switch between these two registers in one post (see Appendix A). On the thread I analyzed, Black Talk was used to frame most of the revealing and concealing cues as well as to talk about technique. In fact, Black Talk was so pervasive that it defies quantitative analysis: members used Black Talk to control the pace at which information is revealed

Table 7

Black American Speech Genres

Call-and-response	"Spontaneous verbal and non-verbal interaction between speaker and listener in which all of the statements ('calls') are punctuated by expressions ('responses') from the listener" (Smitherman, p. 104).
Signifying	A broad category of indirect critique that uses hyperbole, irony and metaphor; unlike ritual insults, signifying implies latent but serious criticism (see, for example, Gates, 1998)
Boasting and bragging	Boasting is hyperbolic self-praise that is intended to be humorous; it is "not intended to be taken seriously" (Ball, p. 235). Boasting is contrasted with bragging or actual self-praise. Bragging is acceptable if the speaker is bragging about personal skills or attributes and can prove that the claims are true. Within traditional Black talk, bragging about material possessions is strictly unacceptable(p. 235)

Table 7

Black American Speech Genres cont'd

	*Copula omission: "*What kind tape, what kind glue?" *(<Celie>, 5.23.2009)*
Verb tense differences:	*Use of* done *for completed action* : "Luv done found the thread" (<Lwhite>, 5.23.2009)
	Use of invariant be: *"*Lwhite I swear you be killin me wit them one liners!" (<LUVMYHAIR631>, 5.23.2009)
	Omission of initial vowels : "Good grief woman you bout to get us all killed up in here" (<Lwhite>, 5.23.3009)
Sound Changes:	*Simplification of consonant pairs* "I'll be back wit da next app" (<LUVMYHAIR631>, 5.23.2009)
	fluctuating – s :"Times for the questions" (<honniecake>, 6.27.2009)

(call and response), to boast about their own application skills without sowing conflict, and to demonstrate insider status using (written) Black grammar and pronunciation. This use of Black Talk also served to reinforce the boundary between "newbies" and "vets"; without an understanding of Black Talk, it would be difficult for any outsider to

read the revealing and concealing cues or obtain technical information on the lace fronts forum.

This use of Black Talk to communicate about wigs presents an interesting case study for technical communication research, which up until now has focused on Edited American English and has largely ignored other languages and dialects. As noted in the beginning of this chapter, lace wigs have been widely adopted by women of all ethnicities. However, the Lace Fronts forum is perhaps the only source of technical documentation about lace wigs on the worldwide web; the wigs themselves do not come with adequate instructions. Therefore, it is not hyperbole to say that understanding Black Talk is a prerequisite to applying a lace wig – regardless of the ethnicity of the wearer. Without such an understanding, it would be hard to obtain even basic information about how to wear the wigs; obtaining detailed information or asking questions would be impossible. .

The findings discussed below provide a snapshot of technical communication in extra-institutional sites. As the site description above illustrates, members of the lace fronts forum find themselves in an interesting double bind: members want to obtain and share information about lace front wigs while simultaneously protecting the secret from outsiders. Although forum members do not explicitly state this, I assume that the "good" of this small community entails keeping these two conflicting goals in balance; I call this balance *prudence* – a synonym for *phronesis*, the knowledge associated with praxis. In order to teach and enforce prudence – the balance – members stage their communication as information games like the 2009 Hairline Throwdown in which they dare one another to reveal information. Largely governed by the rules of Black Talk,

these information games contain subtle concealing and revealing cues that members

must read and understand to make the right (i.e., prudent) play.   Given the

Aspect of the Competition	Players	Structure	Content	Goals

psychological cost to a wig-wearer of having her secret discovered, this is a dangerous

game with no clear-cut rules – and playing it is the only way to obtain coveted

information about making wigs invisible (see table 9, p. 121).

"So You Want A Throwdown, Do You?" : Analyzing The Flow of Information on the Lace

Fronts   forum

As stated in the site description, this chapter focuses on a single thread titled "So

You want A Throwdown, Do you?" (<Celie>, 5.23.2009); members simply refer to this

thread as the 2009 Hairline Throwdown and I use this abbreviated title throughout the

analysis.   The 2009 Hairline Throwdown is hardly unique; it belongs to a genre of

"Hairline Throwdown" threads that recur semi-annually on the lace fronts forum.   The

term throwdown suggests a competition; in brief, the purpose of a hairline throwdown is

for members to compete for the honor of most realistic lace wig application.   Members

enter the competition by posting pictures of their best applications on the thread (in

accordance with certain rules governing the submissions, as outlined below).   But this

competitiveness is largely playful; as member <Celie> explains, "There is no winner.

Hairline throwdown threads are just trash talking and showing off threads done for fun":

Theme:	Lace fronts forum members.	Structured by genres of Black Talk	Implicit rules	Maintaining community life by revealing and concealing information (praxis)
Examples :	"Vets" or insiders contribute plays. "Newbies" or outsiders contribute commentary.	Call-and-response, etc.	Revealing and concealing cues	*Knowing how* to read the revealing and concealing cues and make a prudent play (phronesis).

(5.28.2009). The tone of the 2009 Hairline Throwdown is never serious; members' responses to the posted pictures consist predominately of praise and encouragement). Bad applications or pictures are simply ignored, and none of the 1,298 posts in the thread offers direct criticism or critique. With the exception of one dispute about language, the tone of the 2009 Hairline throwdown is light and jovial, and members often use the word *game* to characterize the thread (I adopt the term *competition* instead of *game* for the purposes of this analysis to avoid invoking the body of game theory associated with the latter term):

> oh...oh..the competition is pretty stiff ...there are some serious apps on this thread....I need to tighten up my game a lil' (<tressa>, 5.23.2009)

slammin' pix down on the table like it's a Dominoes game......PA-YOW.
(<sugarbaybe>, 5.24.2009)

Puppy is one BAD Mama!And alway brings her A game. (mujerc 5.24)

Game over Sexi is here. (<Lwhite1960>, 5.24.2009)

Watch LWhite, now she is gonna be throwing pics around like she in the French

Open ! (<Celie>, 5.24.2009)

Oh so ya'll up in here tryna throw down, huh? Alright then, who wanna play a

game of "get like me".   (<curlygirl11>, 5.24.2009)

The wide-ranging benefits of participation in this competition include showing off and

reaping praise, bonding with lace fronts forum members and, of course, obtaining

information from "vets" about the application techniques used to achieve the excellent

results in the pictures.

Black Talk is strikingly present on the 2009 Hairline Throwdown thread, as it is on

many other threads on the forum. Even from the first post that starts the thread and

stages the hairline throwdown as a competitive game, the conventions of Black Talk

listed above shape how the game unfolds. The author of the first post – member

<Celie> – begins the thread with a speech genre well-associated with Black discourse:

a *call*:

Hey Sexi, AM, Tressa,T42,Innov, MistressShaka AND Y'ALL <you know who you

are>what cha doing? LWhite, GA, magnoliab,Becky,talldee, ALL y'all genuine,

tried and true, more than a year at this. (<Celie>, 5.23.2009)

Above, member <Celie> calls out specific members of the forum by name. This callout

is specifically directed at forum insiders; "genuine, tried and true" lace wig users who

have "more than a year" of experience applying and wearing the wigs. Later in the thread Celie will specifically elicit a response from these members, initiating a call-and-response pattern that continues for 1298 posts. These responses also incorporate other Black speech genres such as bragging and ritual insults.

However, even as <Celie'>s call is addressed to forum insiders, it also signifies or indirectly criticizes a specific group of outsiders in the audience: new lace wig wearers. Instead of calling these outsiders by name, <Celie> indirectly mocks "new people" on the forum:

> You know, some of these new people come in here and they are asking about all kinds of things.What kind tape, what kind "glue". See, when they start using that kind of language, you know that they gunnin' for a white lace around the whole perimeter. Then they start talking about how much they are "in love" and the hair is "porn" and who on point and they just don't say nothing if it ain't. Divas come in here talking smack - is it Chinese, is it burmese, does the grid call for bleach or ammonia ??? I love the one where the woman wanted to know if she bleached the knots from the top or inside. . And what about the person who asked how much bleach for a B/A bath, and in the same breath, what it was for. And what about the lady who wanted to know who and what was a LadyDi ??. Pleeeeesee.

Above, technical communication entwines with Black Talk as <Celie> parodies the language of new lace wig wearers. When these outsiders post on the forum, they often attempt to mask themselves as more experienced lace wig wearers. However, their mistakes in using the relevant technical discourse belie their outsider status. According to <Celie>, these errors include naïve questions (what kind glue?) and problems

identifying wig parts and materials (hair types, the "grid" base). Without directly naming specific members as outsiders, <Celie> uses a specific genre of Black Talk – signifying (indirect criticism using irony, hyperbole and metaphor) – to illustrate that their technical communication is conspicuously substandard.

At this point, <Celie>'s call blurs the lines between a signifying critique of outsiders and a brag about the insiders' prowess. Alternating brag with signification, Celie explains the rationale behind the hairline throwdown:

So, I thought about it, cause there ain't nothing going on in here but some credit

cards,   that we should spend some time, showing them what IT IS !!

Above, Celie contrasts the true skills of the insiders with the outsiders, who merely possess the wigs (i.e., "nothing going on in here but some credit cards") instead of learning the technical skills required to apply them. As noted in the chart above, the difference between possessions and skills is pertinent to the rules of Black Talk: bragging about skills is sometimes acceptable, while bragging about possessions is universally disdained. Again, <Celie> signifies on these members by mocking their brags:

Oh, and don't forget the ones who been studying Tara and Beyonce and OH

HORRORS, Naomi, who   sachet in here, hands on the hips,*I just found this*

*site **but** I   been wearing LWs for 4 years"*.

This alternating call-and-signification ultimately culminates in a direct call for action:

So ladies, why don't we have some fun? BHM Is like a grave yard – nobody

knows anybody else and everybody only knows the inside of their own cap. Let's

distract them for a few and show them how it is really done … The Great Hairline

Throwdown of '09: IT'S ON!

The 2009 Hairline Throwdown has officially begun – for those who understand the competition.   After all, the rules of the Hairline Throwdown can only be understood by forum members who both understand Black discourse genres and the local traditions of the forum, which call for semi-annual "Hairline Throwdown" threads. Specifically, these members understand that <Celie> has called for high-definition pictures of wig hairlines and that the thread will be paced as a call-and-response, with <Celie> calling for specific members to post pictures. Without an understanding of Black Talk and the local conventions of the forum, following the 1298-post thread is difficult – and participation is impossible.   Embedded within this competitive game is technical information of high value: close-up pictures of excellent applications and the opportunity to discuss how these results were achieved.

"Show and Prove: Revealing Cues on Blackhairmedia.com

The 2009 Hairline Throwdown is a competition bound by implicit rules, and these rules pertain not to the tools and techniques used to apply the wigs (techne) but to prudent contributions on the thread (phronesis). Member <Celie>'s original call solicits application pictures, and a small but central corpus of responses offers these pictures; I refer to these responses as *plays*.   The rest of the responses consist of commentary on the plays. Embedded in the plays and commentary are cues to crafting an effective play; these cues tell members to reveal or conceal information about wigs as the competition progresses. The first such cue is <Celie>'s call, which dares members to reveal their applications. The subsequent revealing and concealing cues are discussed below. As with all information on the 2009 Hairline Throwdown, these cues are couched

in Black Talk; some knowledge of Black speech genres is necessary to decode and follow them.

Because <Celie>'s initial post is a cue to reveal information, the overall tone of the 2009 Hairline Throwdown is one of sharing and revealing; secrecy cues represent a minor but important voice. These revealing cues shape what is revealed in the plays: the staging of the photos themselves, the language of the plays and the pace of commentary.

"Vets" Stage Their Photos

Even before a member takes application photos to post on the thread, numerous cues are present that govern the prudent staging of the photos themselves: the photos must be reasonably close-up, well-lit, and they must encompass different application areas like the hairline (hence the title "Hairline Throwdown". A common theme emerges from these requirements: the photos in the plays must simulate a real-world, face-to-face encounter.

This requirement has a special meaning on the lace fronts forum, where face-to-face encounters are themselves a frequent topic of discussion. In brief, face-to-face encounters with others are perhaps the riskiest aspect of lace wig use: others may stare, ask questions or even pull the lace front wig wearer's hair in an attempt to reveal the secret (see "Your LF Encounters"). From the perspective of lace fronts forum members, this risk is wrought with racial – and racist overtones. In comparison with the hair of women of European descent, Black women's' hair has always been subject to a disproportionate amount of scrutiny and ridicule and Black women are often stigmatized for wearing "fake" hair (see, for example, "Weaves and White Folks", "My White

Extended Family" and "You Look Better With Your Real Hair"). Unsurprisingly, lace fronts forum members consider this scrutiny undesirable and rude, and they spent a large amount of time preparing one another to deflect questions from strangers and friends (see "Your LF Encounters"). More than wig selection and application techniques, everyday encounters pose the greatest challenge to lace front wig wearers who wish to pass undetected. It is these everyday encounters that the Hairline Throwdown photos must simulate.

Nowhere is this requirement more evident than in the emergent demand for application photos in natural sunlight. At the beginning of the 2009 Hairline Throwdown, the plays feature application pictures in a variety of environments: cars and bathrooms, other household rooms and outdoors in various lighting (see <Glamgirlstarr>, 5.23.2009; Special1, 5.23.2009; <Celie>, 5.23.2009). But as the thread progresses and amasses many excellent application photos taken in these environments, new challenges emerge – beginning with a play submitted by member <Lwhite1960> consisting of photos in natural sunlight and accompanied by the words "boom" and "pow" (6.16.2009). This play inspires admiration:

All I can say is my girl LWhite....aint leaving no stones unturned ... (<Nufsayd>, 6.16.2009, see also <MsNini> and <DonnaB63))

– and this, in turn cues other members to play photos "with more sunlight" (<MrsPackman>,6.16.2009; see also <Celie> and <Nufsayd>). This demand for sunlit photos engenders comical stories about members exerting great effort to obtain natural lighting. In turn, these stories are cues (couched in Black Talk, of course) suggesting to new members that "vets" do not hide the flaws of their application but instead take great

care to stage clear and realistic photos for maximum critique:

> I nevah take pictures outside. Outside is too far down for me, but, I stepped to
>
> the window just for LWhite !! I stepped to the window in the shower and used the
>
> top of the trees and the sun as my light test ! See LWhite got me stoned crazy
>
> ! got me standing in the shower taking pictures ! Lawd a mercy ! (<Celie>,
>
> 6.16.2009)

On the 2009 Hairline Throwdown, the rules of the competition evolve as members cue each other to reveal more information in the pictures. These revealing cues culminate in a demand for pictures in natural sunlight and in comical stories about the difficulty of doing so. Certainly, it would be an exaggeration to say that this demand (and these stories) cannot be understood by those who are not proficient in Black Talk. However, a broader understanding of Black culture is necessary to understand why such well-staged photos would be necessary (i.e., because Black hair is subject to such scrutiny. This culturally-sensitive information is crucial to crafting one's own play with the help of a genre of Black Talk that celebrates the triumph of skill under fire: the *brag*.

"Vets" Show and Prove: The Play as a Brag

The 2009 Hairline Throwdown is a competition governed by the rules of Black Talk, with an awareness of the scrutiny to which Black womens' hair is subjected. Members <Celie> and <Lwhite> challenge members to use perspective and lighting to simulate this scrutiny. If one is up to this challenge, what form could her play take but a *brag*?

As described in the Research Methods section of this chapter, the *brag* is one of two genres of Black Talk that permits self-praise. Unlike the boast, which is purely

fictional, the brag pertains to actual skills that the speaker (ostensibly) possesses. According to Smitherman and others, bragging is permissible under two conditions: 1) the brag concerns skills, not possessions, and 2) the speaker can back up the brag with proof (see, for example, Ball, p. 235). Within Black Talk, the brag is a culturally acceptable way to celebrate one's skill in implicit contrast to those who merely enjoy possessions or other privileges.

With the exception of three modest plays that frame themselves as "a minor contribution" or with similar language(see, for example, <Asianiis>, 5.24.2009) , most of the participants (n= 40) on the 2009 Hairline Throwdown thread frame their play as a brag. These posts follow the rules for bragging outlined above; members must "show and prove" their application skills instead of merely talking about wigs. While the brag itself is a genre of Black Talk, the actual language of the brag is often too telegraphic to contain dialect features and liberally incorporates features of digital writing such as font color, icons and images.   To illustrate these principles, I selected member <innovativelace>'s play (on 5.24.2009) as an exemplar. First, <innovativelace> ("innov" is one of the 10 members who were called out in <Celie>'s initial post; these members' participation is the original objective of the Hairline Throwdown.   Second, <innovativelace>'s post contains no broken image links or deleted images that would hinder an analysis of her play.   Due to the size of the pictures, <innovativelace>'s play

Senior Member

Joined: Aug 01 2007
Status: Offline
Points: 2790

OK OK OK!!!! HOW YA'LL GONNA DO A THROW DOWN AND NOBODY LETS ME KNOW!!!!!

I COULD HAVE GOTTEN MY ARSENAL READY!!!

HERE ARE A FEW PICS THROUGHOUT OUT THE LAST COUPLE YEARS:

YOU JUST GOT HIT WITH THE BOOM!!!

Figure 8: <Innovativelace>'s Opening Remarks

requires multiple screenshots to capture; I have nevertheless quoted it in full to illustrate the relationship among the images and words (See Images 8 and 9): First, <Innovativelace> begins with an implied claim to insider or "vet" status: "How y'all gonna do a throwdown and nobody lets me know?" (see p.131, below). Then, <innovativelace> acknowledges that the photos require some preparation or staging: "I could have gotten my arsenal ready"; she then brags "you just got hit with the boom !!!". An image of a comic-style star with the words "boom !!!!" echoes <Innovativelace>'s brag; a search of Google Images reveals that this is a borrowed image and is not <innovativelace>'s original creation (http://www.bobguskind.com/2008/10/30/the-big-boom-debate-in-prospect-heights-wtf-is-it/). This image is the final verbal comment of <Innovativelace>'s brag.

The remainder of <innovativelace>'s brag consists of carefully sequenced images without accompanying words: Above, member <innovativelace> plays seven (7) photos that showcase a range of skills: the "boom" image, 2 close-ups (Images 2 and 3) and 3 face shots (images 4 and 5) (in indoor lighting) and an image of a nuclear bomb (in outdoor lighting). The most difficult aspect of the wig application (the hairline) is plainly visible in all the photos; figures 9 and 10 alone prove that <innovativelace> has mastered wig application. In the photos, her hair appears remarkably natural. But technique is only part of the competition. The presence of a curly texture in image 4 proves that member <innovativelace> is not simply wearing lace front wigs to mimic the long, straight hair of Europeans – an accusation frequently leveled at Black wig and wig wearers (see, "Fashion Statement or Self-Hatred?", <Ashleysmom>, 1.1.2012). The texture variations shown protect <innovativelace> from such common accusations and

demonstrate her ability to groom various types of wig hair. Furthermore, all of the photos show signs of staging and careful selection; 2 and 3 use optical zoom, 4 appears to be a posed side shot, 6 is a portrait and 7 is a candid shot. Playing these photos of her wigs in various angles and lighting shows that member <innovativelace> understands the purpose of the photos: to simulate the range of real-life encounters as much as possible. Finally, the image of the nuclear bomb shows that <innovativelace> can brag in a variety of media.

Figure 9: <Innovativelace> Front Shot

This exemplary play models prudent conduct on the 2009 Hairline Throwdown; <innovativelace> appears eager to reveal her application and her play offers a range of detailed images, but these images show signs of prudent selection and staging. More specifically, her play contains *revealing cues* that tell other members what to show in a play. First, a play should demonstrate mastery of the brag as a genre – ideally incorporating multimedia. Second, members should reveal a diverse hand of photos, at least one of which should use optical zoom. Finally, <innovativelace> appears somewhat self-conscious of her own status as an insider; this cues others to reveal their self-perceptions of "newbie" or "vet" status, a theme that is present in many of the subsequent post. These are all prudent revelations, and what <innovativelace> ultimately offers is not only an excellent play on

the 2009 Hairline Throwdown but cues that show other members how to attain insider or "vet" status.

"Vets" Ask Informed Questions

In addition to serving as exemplars that contain cues that tell other members what to reveal, plays like <innovativelace>'s serve

Figure 10: Image of a Nuclear Bomb

another function on the forum: facilitating talk about making (*techne*). In comparison with talk about prudent action (*phronesis*), talk about making (techne) is a minor theme; only 56 comments address application techniques, and most of these consist of cursory praise. The members of the lace fronts forum are more concerned about prudent action while wearing the wigs (in real life and on the forum) than they are about wig making and application techniques.

But in the commentary that follows a play, talk about techne becomes possible. For example, on 6.27,2009, member <nufsayd> plays a single picture, which is a close-up of the top of her head with numerous partings (see Image 8 on opposing page). This modestly hedged, single-picture play generates a surprising amount of subsequent technical commentary. Member <honniecake> 's post marks this shift away from the call-and-response flow of the thread to a question-and-answer session with <nufsayd> about her application technique:

i really think nufsayd just owned this thread right about now..........

times for the questions (6.27.2009)

According to <honniecake>, member <nufsayd>'s play is so excellent as to warrant a question-and-answer session; her post therefore constitutes a call-within-a-call, and her use of a feature of Black Talk (the fluctuating -s in "times for the questions") preserves the continuity that links the tone of her call with <Celie>'s initial call that structures the thread. A conversation ensues about the artisans, materials and techniques that worked together to achieve <nufsayd>'s excellent results:

Figure 11: <Innovativelace> Side Shot

Wow... simply beautiful.. hair texture, bleached knots and application! What type if unit is this one? Did you bleach the knots on this one as well? (<manndiva2006>, 6.27.2009)

Nuff, that's absolutely gorgeous... you shut it down with that one! What's your scalp technique? (6.28.2009)

Im not sure who the vendor is on this unit. This is the best look and app I've seen on you, and you are owning it. (<Qualified>, 6.28.2009)

sorry for the caps – CAN SOMEONE DO A YOUTUBE VIDEO OR PICTURE BY PICTURE TUTORIAL OF THE BANDAGE WRAP???? it's killing me... I need to know.... get y'all cameras out... make a fotki or something. What can I bribe y'all

with? Y'all sitting on this one... laughing at those who can't master it.... MUAH HA HA... (<lrgrittyw>, 6.28.2009)

Above, members respond to <honniecake>'s call with praise for <nufsayd>'s play and questions about her technique. These in-depth questions solicit information while revealing <Qualified> and <manndiva2006> et al.'s status as insiders who understand the technical significance of <nufsayd>'s single-picture play: <nufsayd> has mastered knot bleaching and can simulate scalp

Figure 12: <Innovativelace> Portrait Shot

on her wig (probably using a bandage wrap). Even the self-professed "newbies" on the thread echo this theme of informed praise:

> Hands down this is your best app to date. I know I am a newbie but I have been watching your apps for a few months now. The true definition of inspiration! (<24inchesorbetta>, 6.28.2009)

Member <24inchesorbetta> may be a newbie, but she knows how to gain information and attain insider status: by "watching" or following "vet" or insider members and participating on the threads. In short, <honniecake>'s call for questions has elicited questions – from those who already have (or know how to get) information.

Member <nufsayd> responds directly to these informed questions, beginning with

an interesting response to <honniecake>'s call:

Hey honniecake...girl all the answer to the questions are right here on the board...BHM has some talented ladies.

Figure 12: <Innovativelace> Candid Shot

Above, <honniecake> alludes to the unique information structure of the lace fronts forum, where information is hidden in plain sight (and can be found by those who understand how the forum is structured). Next, <honniecake> directly answers the questions that members have posed to her:

This is a Chinese Light Yaki...and yes I bleached the knots myself...this is one of my favorite textures...simple, smooth and elegant. And thank you for the compliment. (6.27.2009, response to <manndiva2006>)

Qualified....I've read up on all your apps...so I also picked up a couple of your tips from the Archives...your apps on always on point. and thank you for the compliment (6.28.2009, response to <Qualified>)

Lrigy - Thanks for the compliment girl...I absolutely love the braid you did in the other post. As far as my scalp technique...I use the bandage wrap and then put MAC foundation on top (6.28.1009; response to <lrigyttw>)
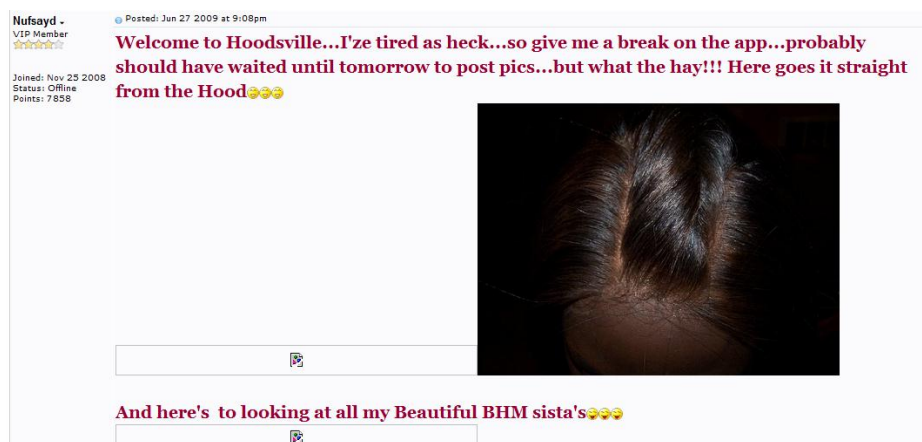
Nufsayd -
VIP Member
⭐⭐⭐⭐⭐

Joined: Nov 25 2008
Status: Offline
Points: 7858

○ Posted: Jun 27 2009 at 9:08pm

Welcome to Hoodsville…I'ze tired as heck…so give me a break on the app…probably should have waited until tomorrow to post pics…but what the hay!!! Here goes it straight from the Hood😂😂😂

And here's to looking at all my Beautiful BHM sista's😂😂😂

Figure 13: Single-Image Play by <Nufsayd>

What is most striking about <honniecake>'s answers above is that she has responded to members' questions without revealing too much information. For example, <honniecake> reveals the texture of the wig in the very jargon that <Celie> mocked in her initial call: "Chinese Light Yaki" (See <celie>, 5.23.2009: "is it chinese, is it burmese?"). Similarly, <honniecake> confirms that she bleached the knots herself without providing further information. Although <honniecake> does directly answers <lrigyttw>'s question about the bandage wrap by revealing the materials she used in the picture ("I use the bandage wrap and then put MAC foundation on top"), this succinct reply ignores <lrigyttw>'s plea for an in-depth tutorial. To obtain this in-depth information, <lrigyttw> must play pictures of her own lace wig application using the bandage wrap and request guidance.

Members perceive the 2009 Hairline Throwdown as a competition that can be played to obtain coveted information about lace wigs. Black Talk gives this game its call-and-response structure; this dialect of American English also shapes the plays and influences the way photographs are staged. The content of this competition is governed by complicated rules about concealing and revealing information. Rather than directly articulate these rules, members of the lace fronts forum give off cues about what to reveal or hide; following these rules helps each member craft a prudent play. The

revealing cues covered in this section are summarized in Table 9 below (p. 137). These cues pertain both to the plays (contributions of pictures) and commentary on the thread; however, commentary and questions are an ineffective way to obtain information on the lace fronts forum. This information can only be obtained by entering the competition.

"Poof...." : Secrecy Cues on the Lace Fronts Forum

The 2009 Hairline Throwdown is a call to reveal information about how lace wigs are worn. Embedded within the thread and framed in Black Talk, innumerable cues tell forum members who should reveal this information ("vets"), when to reveal it (spontaneously or when the member is called out), and how (as pictures of wig hairlines in natural sunlight). However, members also strive to protect "the secret" of lace wigs from widespread adoption; and all this talk about lace front wigs increases the risk that the information may be discovered by an outsider. Therefore, even as members reveal information about lace wigs, they also work together to conceal it. Embedded in the Hairline Throwdown thread are innumerable cues that prompt members to hide information and / or demonstrate how to do so. In total, 176 posts on the 1009 Hairline Throwdown thread contained these concealing cues. Often running parallel to the discovery cues, the concealing cues enable members to be prudent – to participate in the thread without compromising the larger value of community secrecy.

"Vets" Delete Their Pictures … But Leave a Trace

When I first read the archived 2009 Hairline Throwdown thread, the first interesting feature of the conversation that I noticed was the widespread removal of

Table 9

Summary of Revealing Cues on the Hairline Throwdown

Prudent action	Revealing Cue	Relevant genre of Black Talk
<Celie>'s initial call :	Cues members to reveal their application pictures.	call-and-response
Staging photos :	Cues (or even dares) other members to reveal as much as they can in their lace wig photos.	"Weave checking" (Not a genre of Black Talk but a culturally relevant practice).
A *play* or contribution of pictures :	Cues members to "show and prove" their application skills.	The brag
Asking informed questions:	Cues members to ask questions that reveal what they know to obtain technical information. (In-depth information can only be obtained by playing the game.)	call-and-response

pictures. Over 50% of the pictures that members originally posted were eventually removed (see, for example, <special1>, 5.23.2009; <andromeda>, 5.23.2009; <flyat40>, 5.24.2009). In brief, the purpose of removing pictures is to prevent them from being used by others; specifically by unscrupulous wig vendors who browse the lace fronts forum for pictures of lace front wigs to use (without permission) on websites

and in advertisements (see, for example, "Are any of these you?", 4.28.2009). This theft of pictures both compromises personal anonymity (if a member's face is seen on a wig advertisement, her secret is out) and generally enables vendors to broadcast the secret by advertising the wigs. Therefore, posting application pictures is prudent in that this enables participation in the thread (and access to information about how the results were achieved) but potentially imprudent because posted pictures may be misused, compromising the community value of secrecy. .

For these reasons, some members refuse to post any pictures at all (see <msplaygurl>, "Are any of these you?", 4.28.2009). But the more common approach is to delete pictures after enough time has elapsed to generate conversation as <special1>, <andromeda>, <flyat40> and countless other members have done. In the context of the revealing cues, deleting one's own pictures is in itself problematic. Doing so removes evidence that one has participated in the thread by revealing something, thereby potentially compromising the member's ability to use the picture as a springboard for conversations about lace wigs. Also, simply removing pictures communicates nothing to other members about the risk of posting photos. Thus, lace fronts forum members are caught between conflictual cues about revealing and concealing photos. This double-bind generates an interesting practice on the lace fronts forum: members who delete pictures leave a verbal trace indicating that something has been removed.

This verbal trace is the word "poof", which forum members type in the place of removed photos (with various punctuation):

Poof …. (<Special1>, 5.23.2009)

*poof (<Ilovelife>, 5.24.2009)

2. POOF * (<nufsayd>, 5.24.2009)

POOF   GONE   !!!!   (<sexibeach>,   5.24.2009)

This is the most widely used verbal trace on the lace fronts forum; alternate versions include typing an ellipsis or a dash in place of the pictures.

Thus, members give multiple verbal cues to indicate that pictures should and have been deleted. While pictures are up, the admonitions "don't steal" and "don't quote" indicate that pictures may be "stolen" or accidentally replicated through the forum quote function (the replicated pictures are difficult to remove). These admonitions may exist as in-text comments or as watermarks on the pictures themselves; some members also blur or erase identifying details from the photos before posting them. After the pictures have been visible long enough to generate conversation (or reap compliments), the author subsequently edits her own post to delete the pictures.

Telling Tall Tales: Vets as Runaway Slaves

Earlier in this chapter, I have covered various ways that members can contribute to the 2009 Hairline Throwdown thread without taking the risk of posting a play. Because the members of the Lace Fronts forum model their behavior after the "Vets", non-play posts contributed by the "Vets" become concealing cues to other members that evolve into memes. These concealing memes enable many members to participate without playing.

But these memes meet with some resistance on the forum. Frequently, all forum members (both "newbies" and "Vets") will use calls or callouts to prompt specific members to reply. With the call or callout, a member will request pictures from a

specific member by name (usually a "vet") by name. The first call or callout of the thread – of course – was <Celie>'s initial call. As the thread progresses, other members imitate <Celie> and her call evolves into a meme:

Ok I don't want the thread to die soooooo now I am calling out people (I hope yaall are lurking … LADY DI..AFROGERMANGIRL…ISRAEL… i*AM*NOT*MY*HAIR…STARDAQUEENB23..SPECIALANNOINTED...JOINT~HEIR..LIPZ…ANGIEDEE.WHERE YaALL AT?!?!?!? (<TheSecret>, 6.5.2009.

Celie oh Celie, where are you ? (<Nufsayd>, 1.6.2009)

Someone please tell NeedTresses to show us *what she working with.* I see her giving advice up in here, but where is her street creds? Yeah I am calling you out, forget what I told my daughters. You better try to be seen and heard. HOLLA!! (<Lwhite1960>, 5.24.2009)

STOMPING THE FLOOR Ms. Celie.. Ms. Celie..Where you be?(<Lwhite1960>, 6.4.2009)

eeennnnnnie,meeennnnnnniiie mightee Moe, what you calling my name out fo ?? (<Celie>, 5.6.2009)

Above, <Lwhite1960>, <PrettySassi> and <TheSecret> – a group encompassing "vets" and members of indeterminate status – demand application pictures from various recognized "vets". The tone of these callouts is hyperbolic and comical. Of course, members can only exert limited social pressure by calling each other out, and have little or no ability to enforce these demands for pictures. They can only "stomp the floor" and wait for a response (<Lwhite1960>). Therefore these requests constitute subtle boasts,

with members asserting the right to demand pictures regardless of their inability to enforce the demand.

But occasionally these callouts-as-boasts degenerate into name-calling. In one notable example from the 2009 Hairline Throwdown thread, <Celie> attempts to prompt <Sheryse> into revealing more application pictures by mocking <Sheryse>'s reluctance to participate. In brief, <Celie> calls <Sheryse> a "real chicken head", adding : "You wait until page 88888 to come in" (6.27.2009). The conversation rapidly digresses into a discussion of the slang term "chicken head", which is offensive to <Sheryse> presumably due to the racist and sexual overtones of some definitions of the word:

> Are you calling me a chicken head? Do you even know how insulting that is? <Sheryse>, 6.7.2009)

> Well someone JUST sent me the definition from the Urban dictionary and MY GAWD, it is certainly NOT, NO WAY what I meant and I had NO idea that such a definition existed. The kids used to tease you a chickenhead when you were scared to do something stupid, like light a firecracker or something. We just witness the different worlds of generations collide. But, I still apologize. (<Celie>, 6.7.2009)

Ultimately, this detour into insults disrupts the conversation: Sheryse announces " I am going to exit on out this thread with my alleged chicken head self" (6.7.2009) and does not return to the thread; <Celie>, who has figured prominently in the 2009 Hairline Throwdown until now, remains silent for 9 days and refers to her silence when she re-enters the thread on 6.16:

Uh Hunh! It ain't ovah till it's OVAH. Thought I was sleeping didn't ya? (<Celie>, 6.16.2009)

This disruption illustrates the intensity of revealing cues on the 2009 Hairline Throwdown thread and their inherent risk: when the pressure to reveal information becomes too intense, the conversation can break down and harm the camaraderie of the community as a whole.

The called-out members named above therefore face a problem: post, and expose themselves (and the secret) to criticism, or remain silent, and face escalating callouts and ridicule such as the exchange between <Sheryse> and <Celie>. It is within this context that an interesting pattern or meme emerges. The meme beings with – and is sustained by – a recurring exchange of callouts and concealing moves among <Lwhite>, <Nufsayd> and <Celie>. Instead of attempting to reduce this meme to a summary, I will let the data speak for itself (see opposing page).

In brief, <Nufsayd>, <Lwhite> and <Celie> engage in some collaborative storytelling draws heavily on imagery and language from the history of slavery in America. I identify their story as a tall tale because it is a hyperbolic and fictional story about runaway slaves. This story becomes a meme that these 3 members use to excuse themselves from posting a play:

I been running from the slave catchers! Hiding in the woods and didn't want my camera flash to grab their attention!!   (<Celie>, 6.5.2009)

I is under this bushel basket.hiding. (<Lwhite1960>, 6.26.2009)

The slavery meme therefore serves a dual function, enabling these 3 members to participate in the thread (and even call out other members) without posting plays of their

own. As discussed in the site description, offering comments without playing is ordinarily discouraged on the 2009 Hairline Throwdown thread. It is surprising that other members reward the slavery meme with attention and praise:

Stop this before I suffer brain damage.... I can hardly breathe over here! (<Needtresses>, 6.17.2009)

Lwhite, Nuffy and Queen Celie....thank you for making my day. (<Chante>, 8.3.2009)

I see Lwhite and Nuffy are making sure this thread stays alive! Go chicas. (<Amandagirl>, 6.20.2009)

Somehow, <Lwhite1960>, <Celie> and <Nufsayd> have managed to play without playing. Although they have posted no new plays of pictures, their posts following the slavery meme receive the praise that is normally reserved for plays. Instead of responding to the immediate revealing and concealing cues that are present on the thread, these three members have tapped deeply into the shared cultural history of the lace fronts forum to change the structure of the competition.

Conclusion

Phronectivity: A Means of Expanding User Concepts in Extra-Institutional Technical Communication

This analysis is guided by a central research question about information and praxis: in the absence of institutional rules, how do members of extra-institutional sites manage the flow of information to attain the community "good"? On the lace fronts forum, the community "good" consisted not of one value but a balance of conflicting

goals: discovery and secrecy, which worked in tandem to maintain the life of the community. The strategies that "vet" members employed to conceal and reveal information influenced other members to do the same, and large-scale patterns in information management developed. These patterns included using Black Talk to structure conversations, using technology to mimic face-to-face encounters, and leaving a verbal trace to signal that information has been deleted.

In many respects the Lace Fronts forum is remarkably unlike Hackaday.com, the extra-institutional site I analyzed in Chapter 2. Many of these differences arise from differences in the moderating technology; Hackaday.com is a stand-alone blog and the Lace Fronts Forum is of course) an online forum that belongs to a high traffic site. Hackaday.com is populated with anonymous participants; the Lace Fronts forum has *members* with stable identities (screen names) who gain (or fail to gain) reputations and status on the forum. On Hackaday.com, the conversation topics are pre-determined by contributors; on the Lace Fronts forum, any member with more than 50 posts can start a new topic. It is therefore not surprising that Hackaday.com participants' activity consists of commenting (calculatively and meditatively) on pre-determined topics, while the members of the lace fronts forum discourage this type of spectator participation and reward original contributions (i.e., the plays) from members. Cultural differences and content and also distinguish the members of these two communities and shape their technical communication.

In light of all these differences, one striking similarity unites Hackaday.com and the lace fronts forum: the use of tall tales (or hyperbolic, improbable stories) to effect social change. On the "Dirk's accident" thread of Hackaday.com, participants

<fuzzmanmatt> and <pseudonymous> used improbable stories about neodymium magnets to refigure the human user as an agent – even a victor-- instead of a victim. On the 2009 Hairline Throwdown thread of the lace fronts forum, members <Celie>, <Nufsayd> and <Lwhite1960> told hyperbolic runaway slave stories to subvert the implicit rules for participation in the thread. In both cases, the storytellers reached deeply into the values and ideals of each online community (the solitary, adventurous hacker and the cunning runaway slave) to tell stories that resonated with participants and members.

Far from idiosyncratic outliers, these tall tales represent a potent critique of what Ranney (2002) identifies as a "closed" or tautological system associated with the view of technical communication as praxis and phronesis:

> Using praxis to question practice, however, presents us with a dilemma
> embedded in Aristotelian phronesis. Sources from the Nicomachean Ethics
> (Book 6, Chapter 4) through Hans-Georg Gadamer, Joseph Dunne, and
> Miller herself note that the end of phronesis lies in itself, so that, to quote
> Dunne glossing Gadamer, "one is never sufficiently at a distance from it to be
> able simply to use it" (Dunne, p. 126; qtd in Ranney, p. 211).

In other words, community values or goods are self-reinforcing; therefore, a view of communication that "maintains the life of the community" (Miller) simply perpetuates these community values, leaving little room for critique. Furthermore, these community values may be "dictated to us by the technical system itself," leaving "no extra-technological basis for achieving consensus on those values" (Miller, p. 236; qtd in Ranney, p. 211). In the worst-case scenario, community members may blindly enforce

community values that have been shaped by technology; this is "a rhetoric appropriate for slaves" (Sullivan, p. 380; qtd in Ranney, p. 212).

It is this "closed system" that the members of both extra-institutional communities effectively subvert. The blog technology of Hackaday.com dictates that participants will respond to hacking projects posted by the contributors; <fuzzmanmatt> and <pseudonymous> steal the show with improbable stories about hacking projects of their own. Arguably, for the members of the lace fronts forum, the very *existence* of technologies such as digital cameras engenders the demand for multiple, high-quality images from members and the tendency to ignore posts without these images. Members <Celie>, <Nufsayd> and <Lwhite1960> effectively subvert this demand when their text-only slave stories receive attention and praise. In both cases, the storytellers subvert a community value that is obviously shaped by the forum or blog technology that hosts the community's writing (i.e., commenting on posts, contributing "pics") with deeper community values that do not depend on the community's immediate digital environment: the solitary hacker, the runaway slave. While communication on both extra-institutional sites encompasses both techne and phronesis, the tall tales draw on a power that Atwill and Ranney associated with rhetoric-as-techne: the power to "transgress boundaries" and "rectify transgressions" (Atwill, p. 48; qtd in Ranney, p. 212).

This view of rhetoric-as-techne is further explored in Chapter 4, where I analyze collaborative technological production on both extra-institutional sites.

FOOTNOTES

1. In digital writing, a meme is a theme that is imitated and replicated by other writers.

CHAPTER 4

In the previous chapters, I analyzed conversational threads that are representative of the bulk of communication on my extra-institutional sites. On Hackaday.com, "Dirk's Accident" and "Laser Tattoo" attracted enough participation to make the "most commented on" category of active threads on the site. Tensions between calculative and meditative thinking played out on these threads as participants employed unusual techniques (such as trolling and telling tall tales) to explore philosophical issues about technology and society. On the Lace Fronts forum, the most concentrated activity was focused on so-called "Hairline Throwdown" threads. Members treated the "Hairline Throwdown" as a game, challenging each other to show off high-resolution wig application pictures. Technical information about lace wigs was indirectly revealed throughout the gameplay. Perhaps the most striking feature of technical communication on both forums was its indirectness: very little activity focused directly on modifying technological artifacts. With respect to both forums' official purpose of promoting hacking or hair care, much of the communication on these forums appears off-topic.

But, on both sites, direct technical communication does occur. From time to time, participants and members talk about how to build and modify technological artifacts. On both forums, these are sporadic moments that stand out against the background of the everyday communication outlined in Chapters 2 and 3; but when these moments do occur, they generate much attention and activity. Therefore, for this chapter I turn my attention away from everyday communication on extra-institutional sites and toward the sporadic moments when direct technical communication occurs. Here, participants

engage in the trial-and-error process of brainstorming ideas and working on artifacts to achieve often novel results; therefore, these moments have unique transformative potential – although this potential may not always actualize, as illustrated below.

For this chapter, I collected and analyzed data from two representative threads from Hackaday.com and the Lace Fronts forum: "Analog Joypad for your Retro Pc" (1.26.2012), which teaches the craft of making a joystick from recycled materials, and "Stop Using Glue Or Tape" (6.18.2009), which teaches an adhesive-free wig application. Because both threads represent direct technical communication in the form of instructions, I review some technical communication literature concerning techne, focusing on the philosophical question of what aspects of techne are teachable (Mitcham). Because previous chapters have already analyzed general communication on these forums, I focus my analysis on two approaches to teaching techne: teaching processes and teaching forms, which (as Mitcham claims) deeply correspond to two diverging ways of conceptualizing artifacts: techne and technology, both of which loom large in contemporary technical communication.

According to Mitcham's scheme, these two terms – techne and technology – are closely related to two philosophical views of technology: the engineering perspective and the humanities perspective. The humanities perspective "typically begins with nontechnical aspects of the human world and considers how technology may (or may not) correspond" (p.63). This humanities perspective aligns closely with techne, which considers the end use (telos) of a tool or artifact as the primary goal of making activity (Johnson). Contrastively, the engineering perspective uses technology as a lens through which to interpret the world. These "analyses of technology from within" view

"the technological way of being-in-the-world as paradigmatic for other kinds of thought and action" (p.39). These two perspectives are both simultaneously reflected in the phrase "thinking through technology", which is the title of Mitcham's book: the humanities thinks-through (or contemplates) technology, while engineering thinks *through* technology. Both of these broad perspectives toward technology are pervasively represented in my data.

Introduction: Techne, Technology and the Limits of Instruction

Because technical communication so frequently (but not always) exists as instructions, one philosophical issue at the heart of technical communication is the question of what is teachable. Technical manuals, those infamous products of technical communication, are often dense and poorly written. Technical communication scholars have long advocated change in this area; technical instructions should be more concise and interactive (Carroll et al, 1987), and incorporate both technical writers and end users in every stage of technological development (Johnson, 1999). Above all, technical instructions must consider the logistical and spatial problems associated with technology use: as Johnson concisely explains: "To engage with a technical artifact and a text at the same moment is a complex and frustrating task that illuminates the paradox of learning through doing" (147). Logistically, there are limits to how much instruction a user can receive while simultaneously operating the technology at hand.

On the surface, these may appear to be mere logistical issues that technical writers can solve by developing streamlined manuals and "user-friendly" interfaces. Theoretically, writers could so effectively integrate documentation into a technology that

the technology effortlessly instructs the user at every point of contact. Indeed, many scholars and developers advocate and strive for this ideal, which is usually termed "user-friendly" or "intuitive" design (Norman). However, beneath the surface of logistical problems related to technology use and documentation, a deep philosophical problem is at play. This problem concerns the limits of what is teachable.

Philosopher of technology Carl Mitcham offers the most thorough account of the problems that arise from something as simple as instructions. To accomplish this, Mitcham reaches back to the ancient concept of techne (making). While the *techn-* of techne is etymologically linked to technology, this link is deceptive; as Mitcham illustrates, techne and technology offer radically different perspectives on the activity of making. According to Mitcham, ancient techne or making was guided by an awareness of a distinctly metaphysical force: the inherent "desire" of matter to take shape:

> For Aristotle and Aristotelians … no matter, even that strictly logical construction prime matter, is a purely neutral or lifeless stuff to be imposed on at will; it seeks or is related to form – in any particular case, in some particular way. That is why Aristotle can quite legitimately speak of "a "desire" on the part of matter (Mitcham, p. 133)

This "desire" inherent in matter corresponds with an ideal disposition on the part of the artisan: a "sensitivity" or receptiveness to the matter's desire – the artisan understands what form the matter desires to take. Without this sensitivity or receptiveness, the whole process of making (techne) is irrevocably altered:

Absent an artisan's deep sensitivity to the particular characteristics of this ordering toward form, this "desire" of matter, the result will almost surely be a weak unity, one tending to either rapid physical decomposition or aesthetic disorientation (which is only decomposition of another sort) or both (p. 123)

Classical scholars do not specify how one develops this metaphysical sensitivity to the desire of matter. In fact, doing so is impossible – desire, sensitivity and receptiveness are "mental dispositions" and not technological processes that can be taught. As Mitcham repeatedly points out:

As to the how or activity of making, the becoming as opposed to being, this can be grasped only through pistis, belief or trust, the mental disposition that in the republic (511d and 534a) Plato associates with the perception of material things (Mitcham 122)

For classical philosophers and modern scholars like Mitcham, this sensitivity to the "desire" of matter plays a key role as the guiding force that shapes all the processes of making. Therefore, the "how or activity of making" – the processes the artisan uses – are also unteachable because they proceed from the artist's perception. This is not to say that techne is generally unteachable; according to Aristotle, only those things that *are* teachable may be properly called techne (Nicomachean Ethics VI). Glossing numerous classical scholars, Mitcham draws a sharp distinction between what aspects of techne can and cannot be taught:

"What can be grasped or known by techne through logos is the form or idea, eidos, the whatness of the thing to be made. What is not as able to be grasped is the activity, the "how to do it" of the actual making, poiesis" (Mitcham, p. 121)

What can be taught is the eidos, or form or idea that an artifact may take; the specific processes employed to achieve this form are up to the artist. Depending as it does on a sensitivity to matter's "desire" or "spirit", this classical techne is a metaphysical activity.

Here, a clear philosophical contrast between ancient techne and modern technology emerges. Modern scientists and engineers do not speak of matter as possessing "desires"; according to Mitcham, "in modern scientific theory, however, matter does come to be conceived of as wholly inert, totally devoid of spirit" (Mitcham, p. 121). Rather, this modern matter is "a purely neutral or lifeless stuff to be imposed on at will"; it can be limitlessly manipulated with the help of modern science. Modern matter has no will of its own.

This is a metaphysical shift with many concrete ramifications. First, because modern matter is "inert", the artisan's sensitivity becomes irrelevant. Thus it is possible to place the artist's actions under rational control; in the modern world, this rational control takes the form of codes and step-by-step instructions that the assembler (no longer an artisan) must follow to order the materials into a specified artifact. Mass production (which would be "unthinkable" to the classical mind) soon emerges:

But is this not precisely what modern technology proposes to furnish – a logos of the activity, a rationalization of the processes of production, independent of, if not actually divorced from, any particular conceptions of eidos or form? Is this not

precisely why it can so vigorously claim to be neutral, to be independent in use on what human beings want to do with it, on purely extrinsic ends? 128

Above, Mitcham astutely traces the difference between techne and technology to metaphysical conceptions of matter. For techne, matter is (in a sense) alive; the artisan's work is responsive to its desires. With modern technology, matter is lifeless. Modern science has furnished industry with the means to transform matter at will, and modern industry does so – on a grand scale, through mass-production. The artisan's role is reduced to that of an assembler who follows instructions to mass-produce artifacts according to the will of industry.   Characteristics of techne and technology are summarized in Table 10 (p. 155).

This distinction provides a sharp lens for analyzing technical communication in extra-institutional sites. On my sites, a small but significant proportion of the communication endeavors to teach something. This teaching appears in the form of hacks, or other short step-by-step instructions; it also appears as tutorials, how-to pages and other genres of online technology instruction. But what, exactly, are all these extra-institutional instructions attempting to teach? Are they teaching technology, i.e., attempting to control what end-users do through step-by-step instructions? Or are they teaching techne, i.e., teaching users how to reason about forms? These questions hearken back to my original research question about technical communication in extra-institutional sites. If and when extra-institutional technical communication is teaching technology, these sites are a mere extension of modern technological institutions that attempt to bring users' activities under control. But if and when the sites teach techne,

<u>Table 10</u>

Characteristics of Techne vs. Characteristics of Technology (cf Mitcham p. 120-130):

Characteristics of techne:	Matter is, in a sense, alive.
	Sensitivity to the form that matter wants to take.
	Making is taught through rational discussion of forms.
	The processes of making cannot be taught and are not under rational control.
Characteristics of technology:	Matter is inert.
	The artist "imposes" form on matter – no sensitivity required.
	The processes of making are subject to rational control, and therefore can be taught.
	Mass production of identical artifacts.
	"Aesthetic disorientation"

this is a truly radical shift away from the original (institutional) site of technological development and toward the individual user-as-artisan.

The Role of Direct Instruction in Extra-Institutional Sites

This analysis focuses exclusively on direct technical communication, in which participants directly discuss how to make and modify artifacts. On extra-institutional sites, this direct technical communication usually takes the form of hacks and tutorials; it may also emerge as direct queries or requests for direct technical information. On Hackaday.com, most of these "hacks" appear in abstract form; the contributors' posts are reviews of other writers' hacks "from around the web" with links to the original project. The "Laser Tattoo" hack from Chapter 2 exemplifies this abstract form – arguably, reducing the hacks to summaries facilitates philosophical speculation (as opposed to, for example, talk about specific details and processes). These posts are prominently archived under the "Hacks" tag featured on the main page of the site. Hackaday.com also offers posts about technology that do not fall within the "hack category"; some of these posts (like "Dirk's accident") are well-received; others are dismissed by participants with the comment "not a hack", a comment that is often followed by inflammatory statements against the contributors or the blog.

As with Hackaday.com, direct technical communication on the lace fronts forum is intermittent and interspersed with conversations about broader issues. However, on the lace fronts forum, members' need for direct information is always in conflict with the code of secrecy; this conflict itself is a frequent topic of direct discussion on the forum. Despite this tension between members' conflicting goals, tips, tricks and tutorials are

part of day-to-day life on the forum and generally receive praise from other members. Direct requests for information are more problematic because they can indicate a member's "newbie" status, and these requests may be ignored or answered depending on how the request is framed.

From this unstructured milieu of sporadic and indirect technical communication I have chosen two exemplary threads that represent direct technical communication on these forums: "Analog Joypad for Retro PCs", which teaches participants how to make an old-school joystick, and "Stop Using Glue Or Tape", which teaches adhesive-free wig application. These threads are exemplars of direct technical communication because of their use of direct instruction, their prominent positioning on the sites and (in the case of "Stop Using Glue Or Tape") their number of comments. It is interesting to note that both threads also involve some technological downshifting: "Analog Joypad" rejects the joysticks that are currently on the market and returns users earlier phase of joystick development, while "Stop Using Glue Or Tape" rejects the modern medical-grade adhesives and teaches "old school" adhesive-free wig wear; member <Tootsie's> method itself hearkens back to the galloon or ribbon band that has been used to secure wigs to wearers' heads since the 16th century.

At the time of this writing, both threads are positioned prominently on the index page of the sites they belong to. Hackaday.com positions "Analog Joypad for Retro PCs" in the "featured" category, which uses special design elements (typeface, font and images) to draw attention to the featured hacks. Although readers may suggest hacks for the blog to cover, the contributors (blog authors) unilaterally decide which hacks to "feature". On the lace fronts forum, the positioning of "Stop Using Glue Or Tape" is (as

usual) a point of conflict. Because of the importance of member <Tootsie's> technique, members have long asked the moderators to make this post a "sticky" (this is forum lingo for a post that always remains at the top of the page. Despite these requests, this post has never become a "sticky" – which members resent:

> So when **Russ** starts wearing Lace wigs, this and other good information and tips threads will become a **sticky** (<Celie>, 1.29.2009)

(Russ [Russell Epps] is the moderator of the Lace Fronts forum, as mentioned in the introduction). Even though moderator <Russ> did not respond to members' numerous requests to make the thread a "sticky", "Stop Using Glue Or Tape" did become a de facto sticky due to the thread's popularity. Because a new post places (or "bumps") a thread to the top of the page, and because the thread is so frequently commented on, "Stop Using Glue or Tape" has remained at the top of the front page since the day it was initially posted. Further, although most of the comments consist of questions or modifications to <Tootsie>'s technique, some of the most frequent comments consist only of the word "bump" or other explicit attempts to bump the thread back to the top of the list. While these tactics effectively keep <Tootsie>'s thread visible, they carry a risk: if the moderator (i.e., Russ) deems these new comments to be too off-topic, the thread may be "locked" to further comments or moved to the Talk section, where it cannot be accessed from the front page of the Lace Fronts forum.

Research Methods

How do participants instruct each other in extra-institutional sites? This broad research question guides my analysis of direct technical communication on

Hackaday.com and the Lace Fronts forum. Drawing on Mitcham, I am interested in two dimensions of instruction: teaching *techne* through forms, and teaching technology by controlling step-by-step processes. My central philosophical question, "Are these extra-institutional sites teaching techne or technology?" is here rephrased as two research questions:

1) How often do the participants on my sites teach or talk about forms? And, when they do, is this associated with an attitude toward making that is compatible with techne (as Mitcham suggests)?

2) How often do the participants on my sites teach or talk about processes? And, when they do, is this associated with an attitude toward making that is compatible with technology (as Mitcham suggests)?

Characteristics of techne and technology are summarized in Table 1, above. As with my analysis of user-centeredness, analyzing these two dimensions of direct technical communication allows me to measure our hopes for extra-institutional technical communication against actual technical communication on the sites. If my participants are teaching techne, this is a radical philosophical downshift to an ancient conception of making – and ultimately a more user-centered one. If on the other hand, my participants are teaching technology, then extra-institutional sites are merely another extension of the long arm of mass-production that ultimately encompasses every aspect of modern life. Furthermore, this analysis allows me to evaluate the usefulness of Mitcham's philosophical exploration of techne to contemporary technical communication scholarship. As shown above, Mitcham correlates teaching eidos with techne and teaching processes with technology – but how well do these correlations hold up to

empirical investigation?   Ultimately, I hope to arrive at a clear conception of what is taught in extra-institutional sites – and how my participants shape the limits of what can or should be taught.

To answer my research questions I collected data from two exemplary threads: "Analog Joypad" from Hackaday.com and "Stop Using Glue Or Tape" from the Lace Fronts forum, both of which are described in-depth above. I collected all multimedia data from both threads, including text, images, videos and links. Taken together, these data are the basic components that make up technical communication on both sites. Advertisements were excluded from the analysis.

After collecting and segmenting the data into posts, I employed a simple coding scheme to analyze the data. Because I have already analyzed the general proportions of techne and phronesis on these sites, I focused this analysis of direct technical communication on what is taught. On my first pass through the data, I simply noted whether the participants' instructions were more characteristic of techne or technology. Then, on my second pass through the data, I noted specific themes characteristic of techne and technology (see Table 11, p. 161). I listed these ideas instead of attempting to quantify them.   Finally, I noted broad correlations between the categories.

Table 11

Themes Consistent with Techne and Technology

Site / Thread	Themes Consistent with Techne	Themes consistent with technology
Lace Fronts forum / "Stop using glue or tape"	The human scalp is the base of the attachment method.	Participants attempt to force the elastic band – and fail.
	Each participant must individually modify the technique to avoid damaging the scalp or wig.	Participants repeatedly request step-by-step tutorials – and <Tootsie> ignores them.
	Participants must "get it" by understanding the novel form or concept introduced by Tootsie's mom.	Tutorials written by other members proliferate in different versions.
	Tootsie's step-by-step instructions are absent, delayed or incomplete – she emphasizes form over process.	Participants want <Tootsie> to patent the technique.
Hackaday.com / "Analog Joypad"	Technology in disguise -- Participants suggest modifications:	The tutorial attempts to re-create a mass produced sensory experience.
	Modifications related to sensory	The controller brings game-

input (button mashing).	playing under rational control.
Modifications to other machines – these are replications.	The step-by-step instructions enable everyone to recreate this experience.
Modifications to processes – these are rational.	Rational tampering.
Modifications to parts – reason and economics.	Wants "a more finished appearance" with a grommet.
What doesn't happen: modifications to forms.	

Findings of the Analysis

At 709 posts, member <Tootsie>'s thread ranks as the current most popular thread on the Lace Fronts forum. To understand the popularity of the thread and its content, some background information about wig application techniques is necessary. Member <Tootsie>'s initial post on the thread addresses an issue faced by Lace Front wearers that is a perennial topic on the Forum: adhesives. Unlike a traditional wig, which is simply placed on the head, Lace Fronts must be skillfully attached to the skin of the scalp using medical-grade prosthetics adhesives. The prosthetics adhesives market offers a dizzying array of choices, some of which are marketed directly to wig wearers,

and Forum members cycle from adhesive to adhesive in the effort to solve 4 major problems:

1) applying a Lace Front with adhesive is *technically* difficult (see Chapter 3),

2) the adhesives are unreliable and can "fail" at inopportune moments (see, for example, **Tootsie**, "Stop using glue or tape", 18 June 2010),

3) the adhesives are expensive (the popular adhesive UltraHold retails at 30$ for a 3.5 oz bottle)

4) the adhesives are damaging both to the wig and to the wearers' own hair and scalp, causing skin irritation and ripping out hairs during removal.

It is not surprising that threads chronicling the search for the "right" adhesive abound on the Lace Fronts forum, with various adhesives trending popular and unpopular with members over time (see, for example, "Best adhesive", 13 August 2010 and "*Ultrahold*", 15 July 2010). Unsurprisingly, these threads are complemented by parallel threads suggesting experimental Lace Front attachment methods requiring no adhesive at all, with members sewing Lace Fronts to cornrows, attaching them using combs and "just slap(ping) it on" like a traditional wig (see Curlie, "Check out my Sensationel lace front Tiffany", 17 August 2010). The problem with these experimental no-adhesive methods is that the wearer sacrifices the seamless appearance of a realistic front hairline, which is the original purpose of the Lace Front itself (see LacyGal, "Stop using glue or tape", 9 July 2010).

In "Stop using glue or tape", Tootsie introduces a no-glue attachment method that the members recognize as new and novel. Like most threads about *techne* in the Lace Fronts forum, this thread begins with a story. According to member Tootsie, the new no-

glue technique was discovered when Tootsie gave her mother, non-member, some lace front wigs as a gift. As a new wearer who is unfamiliar with (and therefore unprejudiced by) medical adhesive application methods, Tootsie's mom devised an ingenious method of attaching the wigs using a strategically placed elastic band. As Tootsie explains, tension from the band "stabilizes" the wig, which stays in place without the use of medical adhesives.

Tootsie's initial post begins by telling the story of this discovery and proceeds to a summary of how to attach the elastic band, with embedded pictures illustrating attachment points for the band behind the ear tabs of the wig. In the 709 posts that follow, members work to understand the concept (eidos) behind Tootsie's mom's invention, replicate (or fail to replicate) the technique and introduce various twists (see "What's Teachable?", below). The thread ends with one unresolved problem, attachment of the sides without adhesive.

Re-animating Matter

For Mitcham, the difference between techne and technology can be traced to two opposing views of matter: one in which matter "desires" to take shape (techne), and another in which matter is inert (technology). Nowhere in my data is this difference more apparent than in "Stop Using Glue Or Tape", where one of the essential wig attachment "materials" comes to life: the human scalp.

In order to appreciate the epistemological shift offered by "Stop Using Glue Or Tape", it is first necessary to understand how participants addressed the scalp in glue and tape application methods. Briefly, the scalp in its natural state is unsuitable for these methods: small natural hairs may catch in the glue, and oils from the skin

compromise the bond. Thus, members would prepare the scalp for glue and tape attachment by epilating the hairline, stripping it of natural oils with acetone, and applying a liquid barrier to prevent hair and oils from re-emerging from the skin. When a member's body rebels against these methods (i.e. her scalp is too oily or the shape of her hairline does not match the outline of the wig), members help her employ additional and more extreme methods to stop oil and hair from interfering with the bond. And even if none of these preparation methods are used, the prosthetics glue and tape are themselves high-tech alterations to the human skin. Arguably, here the members of the Lace Fronts forum are technologizing the human scalp; they have stripped the scalp of its natural "life" to render it an inert material for the application of mass-produced wigs.

It is into this technological milieu that <Tootsie> introduces the most radical element of her method: desire. Perhaps members do not want to modify their skin by applying glue and tape. To introduce this idea, <Tootsie> introduces an outsider figure (her mom) who summarily rejects glue and tape as wig application methods: "She was like, "Yall crazy, I aint putting no glue on my head" (<Tootsie>, 6.23.2009). Here, Tootsie's mom is not merely articulating her preference for glueless methods as an artisan; as illustrated below, she and the participants are also giving voice to the myriad problems that arise when the scalp is conceived as an inanimate material. The scalp is alive; it wants to grow hair. Then, to support the validity of the glueless idea, <Tootsie> draws on her own experiences; she has been attaching her wig with "combs", "and my edges and baby hair has grown back beautifully" (6.18.2009). Into a community that struggles to strip the scalp of its natural properties, <Tootsie> re-introduces care for the human body. As the basic foundation of lace wig attachment, the scalp has come alive.

Those apocryphal remarks from <Tootsie's mom> ("I ain't putting no glue…) soon inspire other forum members to try the glueless application method. Encouraged by "Tootsie and her mom", participants begin to assert their own reasons for rejecting adhesives and "go(ing) glueless. Again, the theme of desire recurs. Refusing to be reduced to an inanimate base for a wig application, members give voice to the scalp's physiological rejection of adhesives and, for the first time on the Lace Fronts forum, this rejection takes precedence over the finished appearance, hold power and other technological affordances that adhesives offer:

> Take a break from glue and tapes and give your hairline a break (<Tootsie>, 6.18.2009).
>
> i hate the glue and tape (<Aishabear>, 6.18.2009)
>
> My side burns stick out and edges, and I don't want to put glue on em' (<Sbrooke>, 6.18.2009)
>
> I am so tired of glue and it is jacking up my hairline (<Lady Velvet>, 6.20.2009)
>
> We are MELTING in the south! There is no way I could deal with that glue right now and my hairline is thanking me big time <Tootsie>, 6.21.2010).

Taking a "break", staying cool, growing hair – these desires, originating in the scalp and finding voice in the members' comments, begin to supersede the technical (i.e., fixative) advantage that adhesives may provide. Tootsie's mom thus has un-technologized the scalp, or removed it from the wig industry's technological control. As she reminds lace fronts forum members of the pain that the scalp feels during adhesive application and removal, the scalp and its sensations re-enters their conscious awareness. Here, the artisan (the wig wearer), the materials of wig application (the scalp and wig) and the end

user (the wearer) have re-integrated into a conscious whole. The artisan not only senses and responds to the materials' desire – she identifies with it.

The Limits of Mass Production

This re-orientation of members' desires further engenders a new approach to scalps and heads: because members are not using mass-produced attachment technologies, the scalp and methods need not be uniform. In fact, because head shapes and sensitivities differ, so should the glueless application methods. What emerges is a wig phrenology – a discussion of different head shapes, natural hair types and their implications. Because <Tootsie> has already adapted her own elastic band to her wig and head, this is a member-driven discussion of how to adapt the technique to individual circumstances:

It will definitely work if you have a nice cornbraided head of hair. Because I have very fine hair, it was hard for me to find a place for the elastic to be under. And the back of my head has not notch or ridge. Which is why scarves fail me. It worked though once I carried the elastic under the place where my braids start (braid bump). (<Celie>, 6.22.2009)

I"m so excited about this method but will this method work if you have a shaved head? (<justgotbettermd>, 6. 22,2009)

Hmm.. I just shaved off most of my hair so i don't see how this would work for me. Any suggestions? (<NyHair>, 6.22. 2009)

I am having the same problem because my hair is so fine. So, I wrap my long braids around each other and pinned. Also, the elastic has to be tight if there is no grip. (<Celie>. 6. 22 2009)

Above, the artist's sensitivity that Mitcham associates with ancient techne comes into play in a modern context. Small variations in the base materials (i.e., the human scalp) engender variations in the attachment technique. Here, it is interesting that the variations in individual hairstyles undercut ideals, stereotypes assumptions about womens' (and especially Black womens') hair: an individual's hair may not be as long or thick as the original method supposes, and it may not be braided in a Black hairstyle (i.e., "cornbraided"). Members do not criticize one anothers' hairstyles, but simply help them to adapt <Tootsie>'s technique. Here the artist's sensitivity takes on a double meaning, as it implies both the ability to adapt to individual variations and the willingness to do so without passing judgment. With the advent of <Tootsie's> technique, the members trade their glue for old-fashioned straps – and modern mass production for ancient artisanship.

But here, a warning: at any given time, the American and Chinese vendors lurking on the forum may steal <Tootsie>'s invention and mass-market it to consumers. "Tootsie", cautions <SoDivine>, "Go tell mom to patent this idea. I am sure someone has already grabbed your pics" (6.29.2009). This theft of intellectual property is so familiar on the forum that members "can see" the inevitable outcomes. For example, <Celie> "can see MsLola coming out with her special elastic bands next week" (<Celie>, 6.29.2009); <Sxftnlvinit> "can see CVs now advertising a new type of LF just to amp up the cost" (8.6.2009). And once <Tootsie's> method was widely adopted, the Chinese vendors did introduce a glueless cap to the market. But, in contrast to her diligent responses to every other post on the thread, <Tootsie> does not address the topics of patents and mass-marketing at all. Although we cannot know why <Tootsie>

does not address these topics, the fact that users must introduce many individualized alterations to make her method work makes the prospects of mass-marketing dim. "My mom and I are just so excited that this has worked for so many of you" (6.30.2009) , she reiterates, subtly emphasizing that the results are not the same for everyone.

What's Teachable?

Mitcham associates techne with teaching forms, and technology with teaching processes – and here the participants on "Stop Using Glue Or Tape" are perpetually in conflict. The conflict is between <Tootsie> and the lace fronts forum members who participate on the thread. Member <Tootsie>'s initial post introduces the glueless concept ("Stop using glue or tape … I promise you it looks like it's glued down!"), but offers only a cursory gloss on the actual glueless technique – and <Tootsie> even considers some of this information extraneous:

> she uses Elastic that u can buy from Walmart for $1.87 and u cut off about 4 inches or so and just sew each end right up under the ear or lower and I even sew a comb on each side for EXTRA security but it will be so flat and tight u really don't need it

That is the extent of <Tootsie>'s initial instructions; she provides no pictures or step-by-step tutorial. Unsurprisingly, the calls for a "step by step" tutorial immediately begin – and persist until the end of the thread:

> This sounds promising...do you have any pics? or can you show how it is put on the   unit? (Nufsayd,   6.18)
>
> Is there any way that you could make a tutorial or step by step instructions with pics? (<Lamexicana>, 6.18)

Could you explain this step by step. I think I understand what she doing. But I would love to make sure. (MsMarcia, 6.18)

I don't really understand it (NYHair, 6.18)

Please provide more pics and step by step instructions. (Rossanew, 6.18)

Above, members struggle to understand <Tootsie>'s concept. They attempt to resolve this ambiguity by requesting step-by-step instructions, a ubiquitous embodiment of the modern drive to teach processes and techniques. What the Lace Fronts forum members desire is a technology: a technique that can be universally implemented and replicated by following logical steps.

But despite these demands for a tutorial, and despite the fact that she continues to participate in the thread, <Toostsie> delays providing more in-depth instructions. What she does provide is a in image of the inside of her wig cap, showing what the wig should look like when the straps are attached – i.e., the form (see image x). When members continue to demand further instructions, <Tootsie> stalls ("I am going to try and take better pics with my camera cause these pics are with my phone") and ultimately returns days later to provide the step-by-step tutorial (<Tootsie>, 6.21.2009; see image). But even here, <Tootsie> focuses on the form of the inside of the cap and pictures of the result with the refrain "this is what it should look like"; the picture of the elastic package "from WalMart" is blurry and she leaves materials and measurements relatively ambiguous ("about 4-5 inches … about 2 inches down from the ear"). She ignores the request for a video. From the standpoint of modern technology, this is a terrible tutorial.

However, from the perspective of ancient techne, Tootsie has accomplished something much more significant by not posting a step-by-step tutorial. Her delays and incomplete instructions (which mainly illustrate the form of the cap interior) force lace fronts forum members to participate in the process of invention.   Absent explicit instructions from <Tootsie>, members can invent their own texts, or instructions, and artifacts, or versions of the method. This process of invention begins in the immediate aftermath of <Tootsie>'s initial post, as member <MsMarcia> enters the conversation to fill in the gaps left by <Tootsie's> cursory mechanism description:

> Okay so your sewing it across the unit not around … The tension from it going behind the ear to ear (around back) pulls it snug on the forehead (6.18.2010).

> She said she braids her hair to the back and then you know how you braid the braids across the back of you head, she then takes the horizontal strap and places in under the braids so it doesn't move, gives it stability … Yes the nape is flapping, but should lay flat (MsMarcia, 6.18.2010)

> I knew what she was talking about cause I have done this before or similar to it (MsMarcia, 6.18.2010)

<MsMarcia> elaborates on <Tootsie>'s description of her idea (i.e., the form) by suggesting processes that could lead to achieving this form: "sewing it across … braids to the back … places it under the braids". Although <MsMarcia> does elaborate on processes here, these are far from lock-step instructions; "similar" processes may be just as effective. In fact, <MsMarcia> goes on to explain that she sewed the elastic in a different place on a different type of wig, and used adjustable straps to prevent her wig from ripping apart from the tension (see <MsMarcia>, 6.18.2009).   This is both an

elaboration of <Tootsie>'s concept and hints that *how* <Tootsie> achieved a glueless cap is unimportant; other processes and forms are possible.

And, in the absence of complete instructions from <Tootsie>, new processes and versions of the glueless cap proliferate on the thread. <Tootsie> herself explicitly spurs the development of these new versions by refusing to provide more instructions after she has posted the interior cap pictures: "Did u see the tutorial on pg 10 boo? Thats about the best I can do unless someone else can do a video for ya...sorry" (<Tootsie> 6.25.2009). Any process instructions or further elaboration must be provided by "someone else", and, again, members enter the conversation to fill the gaps in <Tootsie's> instructions. It is precisely these gaps that spur the development of new versions. Members may not grasp <Tootsie>'s concept or it may not "work for them" (see, for example, <Tootsie>'s rebuttal to <Shandra> on 6.21.2010: "I'm just telling you what worked for me"), but they can pose innovations that are more comprehensible or effective.

This proliferation of techniques begins early on with <Curlyblaque>'s post, which provides links to a YouTube video of a different glueless cap method that "may be simpler". Some members go on to use this method and develop it further. Alongside this alternative method from YouTube, small modifications to <Tootsie>'s method continue to play out as members add new materials and processes to the conversation:

> I just thought of something to add to this. I wear a wig cap and I don't glue/tape my back down but I put strips of tape along the wig cap to hold the wig in place on the sides and nape (6.19.2010)

I just tried it with some velcro elastic (left over with my experiments with Bless a year or so ago) and that works really well with the bandage. Just put it on as Tootsie describes, and let the velcro catch on the bandage (6.19.2010)

I colored the elastic band with a brown papermate fabric pen and then sewed it down completely and that was it. (Beanybabygirl, 6.22)

Through trial and error, these posts add features to <Tootsie's> glueless cap: a more stable nape, blending the band with the hair, and using Velcro instead of or with the elastic straps. These are additions to <Tootsie>'s method.

As the thread progresses, stand-alone tutorials authored by other members emerge. These stand-alone tutorials offer alternatives to <Tootsie>'s incompletely explicated method. Member <Celie>'s method of incorporating two elastic bands is an exemplar of these stand-alone tutorials because of its completeness:

Figure 14: <Celie>'s Instructions

Above, <Celie> does what <Tootsie> hesitated to do : she provides direct instructions that show how to attach a wig with elastic bands. And, unlike <Tootsie>'s infinitely delayed "tutorial", <Celie>'s tutorial possesses qualities that contemporary technical communication values : it is concise, written in plain language and includes a minimalist schematic. But in the text portion of the post, <Celie> hedges at every turn: she is presenting only "a couple of things I have had to do" because of the shape of her head, and this information is only intended to benefit other members "who have such a head". The schematic itself is not so much an attempt at instruction as a "blast from the past", a phrase that refers to other minimalist schematics that <Celie> has posted on the Lace Fronts forum. Of course, <Celie>'s hedging does not prevent other forum members from trying her two-band technique or the other stand-alone tutorials on the thread and eventually debating "the pros and cons of each". Mitcham envisions that classical techne is taught by a single instructor who teaches only forms and allows students to figure out the processes of production; what has instead emerged here is a proliferation of instructors, each contributing forms, materials and processes that individual members must patch together to individually create "what works for them" (see <Tootsie>, 6.21.2010).

Arguably, this twist on techne is an artifact of technical communication in the digital age. After all, such a proliferation of techniques is unlikely to take place within a community of pupils who are working in the same location under the tutelage of the same instructor or school. Even if the instructor teaches only forms, students will observe and copy one another's work as they converge on a set of processes that produce an artifact (even if they are working under a classical instructor who teaches only forms). Paradoxically,

the proliferation of techniques can only take place when the artisans work remotely –
and can communicate their ideas across these remote locations in a context where no
centralized authority exists.

"My Edges Have Grown Back Beautifully": Dual Aesthetic Investment in Wigs and
Natural Hair

Member <Tootsie>'s application technique involves a zone of the wig that is
normally of little aesthetic importance to wearers: the area under the wig cap, which is
not seen during wear. So, the members of the lace fronts forum only concern
themselves with the appearance of the glueless cap inasmuch as it must remain
invisible: the color of the elastic band must not attract attention by showing through the
cap and combs or other reinforcements must be placed "discreetly". Apart from the
invisible problem, members seem unconcerned about the aesthetics of the glueless cap
and freely use bra straps, elastic cut out of clothing and safety pins to execute variations
on <Tootsie>'s method.

But the members' communication reveals a deeper aesthetic investment in
<Tootsie>'s method. As discussed in the introduction to this section, lace wig
application requires total concealment of the wearer's natural hair, which must be tightly
braided and covered with a flesh-colored cloth to give the appearance of scalp under
the lace wig. But even as the lace fronts forum members vow to remain lace wig
wearers for life, their communication about <Tootsie>'s method belies deep concern for
the natural hair under the wig. <Tootsie> proudly claims that her hair has "grown back
beautifully" (<Tootsie>, 6.19.2010) , but other members worry that the elastic band will
cause hair loss on the back of the head or at other stress points (see, for example,

<Hennared>, 6.29.2010). This aesthetic concern for natural hair does not only prove, as discussed above, that lace fronts forum members are reclaiming consciousness of their own scalp as an animate component of the subjective experience of wig wearing. It also hearkens to a more radical possibility: the possibility that lace wig wearers – even self-avowed lace wig wearers for life – may return at some future point to their natural hair, which they may, someday, regard as cosmetically acceptable. <Tootsie>'s glueless application method is not just about convenience and comfort.

But this transition to natural hair is far from imminent; for now, participants on the "Stop Using Glue Or Tape" thread are just as obsessed with their lace wigs as ever. (On a 709-post thread, none of the participants suggests that <Tootsie>'s method could help women transition to Natural hair). But by allowing the wigs to damage and destroy their natural hair, the forum members deliver themselves over to wig technology and become totally dependent on it. <Tootsie>'s method allows the lace fronts forum members to have a new relationship with wig technology, not just as consumers who can freely choose among options, or as users-as-producers alone, but as producers of a technology that offers, as an affordance, the option of not using it. Thanks to <Tootsie>'s method, members can at any time discard the wig and wear their (now undamaged) natural hair.

From the Garage to DigiKey: How the Hackaday.com Participants Mobilize Technology

<Kevin Dady>'s Analog Joypad: (Re)Inventing the Thumbstick

Like "Stop Using Glue or Tape" on the Lace Fronts forum, "Analog Joypad" is displayed in a prominent position on the front page of Hackaday.com (see screenshot).

However, unlike to "Stop Using Glue Or Tape", "Analog Joypad" does not attain this prominent position because it is popular with site participants (at a meager 26 comments as of this writing, "Analog Joypad" is a relatively inactive post). Here, the Hackaday.com editors who control the content of the blog have deemed "Analog Joypad" important; there, they have assigned it to the "Featured" category of posts that the contributors wish to foreground, which is the most visually prominent category on the site. An alternate "most commented on" category does exist further down the page. At the time of this writing, "Analog Joypad" does not appear in that list. The prominence of "Analog Joypad" on Hackaday.com's index page is entirely contributor-driven.

In brief, the purpose of the analog joypad hack is to enhance the experience of playing old or "old school" computer games. These old-school games such as Packman and Space Invaders enjoy continuing popularity in part because of their nostalgic value; playing them reminds users of childhood. But the nostalgic experience is compromised by the design of the new PCs (Personal Computers) on which old-school games are now played. Most new PCs lack the thumb-sized joypad (or thumbstick) that was included with the keypad of old-school computers for gameplay; the thumbstick was a particular feature of the popular Apple II PC. Now, players must use the up-down-left-right directional arrows to play old-school games with a modern keyboard. The "Analog Joypad" hack attempts to re-create the original sensory experience of playing old-school games by building a rudimentary Apple II-like thumbstick from scratch. Like my analysis of "Stop Using Glue Or Tape", this analysis of "Analog Joypad" attempts to analyze the hack along the dimensions of techne and technology. Below, I describe "Analog Joypad" from two diverging perspectives: first, I

describe editor <Kevin Dady>'s perspective on hacking as it is represented in the original hack; next, I describe the participants' responses to "Analog Joypad", which further define technology (and not techne) as the dominant mood of the thread.

Controlling Games, Controlling Processes : The Purpose of <Kevin Dady>'s Hack

In at least one sense, "Analog Joypad" is more aligned with technology than techne in Mitcham's scheme: the overarching purpose of the hack is to control the *process* of gameplay. According to <Kevin Dady>, playing old-school games entails re-creating all of the original conditions of gameplay; serious gamers should re-create the original controller (in this case, the thumbstick) to recreate the original look and feel of the game. Interestingly, the purpose of this nostalgic re-creation is not to help players win the game, a point that <Kevin Dady> underscores in the accompanying video:, saying, "I'm not claiming to be any good at this game" at the beginning of the gameplay video. Further, the experience that "Analog Joypad" wishes to replicate is a mass-produced one: the original experience of playing games on an Apple II PC. This attempt to bring processes (and experiences) into conformity with a mass-produced artifact links "Analog Joypad" with technology in Mitcham's binary – a link that plays out in every aspect of "Analog Joypad", but most conspicuously in the emphasis on process.

"I Will Show You How To Get There": Teaching Participants to Do-It-Yourself

But <Kevin Dady> is not satisfied with merely controlling the processes of gameplay via the thumbstick; special effort is also exerted to bring the process of *building* the analog joypad device under rational control. To begin, Hackaday.com does not trust any hack "from around the web" to teach readers how to build an analog

joypad. Instead, "Analog Joypad" is presented as a stand-alone hack that is exclusive to Hackaday.com; therefore, this hack is out-of-genre for the Hackaday.com blog (which normally re-presents material from other sites). Along with the authorship, the form of this hack is unique. Unlike with other Hackaday.com hacks, "Analog Joypad" has no summary write-up that readers may skim. On click-in from the "featured" category, a full narrative of instructions presents itself (see screenshot); with no summary write-up, readers must peruse the full instructions to discern the purpose and form of the hack. What <Kevin Dady> offers here is direct instruction – and lots of it.

Contributor <Kevin Dady> begins by describing his motivation for creating the hack:

> What I really wanted was a game pad like device for my 1986 Apple IIc, using one of the modern thumbstick analog controllers.

This will for an analog thumbstick is what motivates <Kevin Dady>'s build.

In order to actualize his will and create the analog thumbstick, <Kevin Dady> must bring his random assortment of building materials to order. In this respect, <Kevin Dady> triumphs – a triumph that he frequently celebrates in the instructions: after exerting "only a little bit of effort", <Kevin Dady> "got exactly what [he] wanted"; the homemade thumbstick "plays good and looks nice". For <Kevin Dady>, as for Mitcham, this triumph over building materials is closely associated with teachability. "I will show you how to get there!", <Kevin Dady> proclaims, reassuring the reader that the build requires only "some basics" and a little "bothering … with math". More reassuringly, the math "does not have to be exact"; after all, "it is just a matter of wiring everything up"; soon it will be "time to button everything up and play some retro games". For <Kevin

Dady>, will [as noted] gives rise to easy actualization; through language, he imparts this actualization to others. The analog thumbstick practically builds itself.

In summary, dominating materials and controlling processes are the central themes of <Kevin Dady>'s hack. Because Mitcham associates these themes so closely with technology, these themes seem out of place on a hacking website whose philosophical purpose is to subvert mass-production. But at this point, <Kevin Dady>'s hack lacks other core features of technology.   First, <Kevin Dady> has remained sensitive to the inherent properties of his materials; second, "Analog Joypad" lacks the qualities of mass-production and aesthetic disorientation, both of which require others to replicate and respond to the hack. As a stand-alone hack, "Analog Joypad" possesses a certain philosophical inertia; it belongs neither to techne nor technology. As a blog post, "Analog Joypad" simply awaits the participant comments – and these comments do polarize the hack along one dimension of making (technology), as shown below.

The Participants' View: Mobilizing the Thumbstick

Resistance and Recombination

As described above, contributor <Kevin Dady> began with a will to recreate the original gameplay conditions of Choplifter, and the participants on the thread share this nostalgia for the game. Thus, the eidos (concept) of <Kevin Dady>'s hack goes unchallenged: participants agree that Choplifter should be played with the original thumbstick.. "Wish I still had the one I made for my C64. Back in '86", reminisces <Steven>, "But then I wish I still had my C64" (1.26.2012). "Better sound on the 64, too", adds <Hirudinea> (1.26.2012). All in all, <Kevin Dady>'s idea receives unusually high praise: "Looks sweet!" (<Skitchin>, 1.26.2012); "I am impressed" (<MarkyB86>,

1.26.2012); "you have a bright future ahead of you in the computer industry thirty years ago" (<Hirudinea>, 1.26.2012). Even with <Hirudinea>'s sarcasm, these comments constitute unusually high praise on a forum where participants attack the contributors outright on a regular basis. Like "Stop Using Glue Or Tape", "Analog Joypad" is well-received.

But on this thread, unlike on "Stop Using Glue Or Tape", no one wants to be taught. In this respect, "Analog Joypad" markedly diverges from "Stop Using Glue Or Tape" and its participants who clamored endlessly for a "tutorial". The "Analog Joypad" participants request no further instructions from <Kevin Dady>. Instead, they work together to challenge his process step-by-step.

Though participants challenge every step of <Kevin Dady>'s build process throughout the comments, an early exchange between <Kevin Dady>, <Jeremy Pavlek> and <smoky behr> exemplifies the rational nature of the participants' critique. I have quoted this exchange in full to provide a more complete picture of the participants' challenges and <Kevin Dady>'s response. In this particular exchange, participants debate the best way to position the thumbstick controls on the same plane as the top of the box:

I've used those boxes with aluminum tops (bottoms) before and had the same issue. Why didn't you just add some washers under it to raise it up, instead of filing the sides down? (<Jeremy Pavlek>, 1.26.2012)

The plate is not thick enough to support any pressure (like mashing buttons) so

when I added washers it would flex in the middle. The box has some ribs on the side which are meant to hold boards, and as a bonus they support the midsection of the metal plate preventing flex. (<Kevin Dady>, 1.26.2012)

Ah, ok, that makes sense. I didn't think about the button mashing pressure. And in thinking more about it, you couldn't add anything to the underside that would have been as quick and cheap as you did. (<Jeremy Pavlek>, 1.26.2012)

You could have scrounged or (heaven forbid) bought some thicker material that would have been able to stand up to the stresses of button mashing, and would have been more flush with the lip on the box. An alternative would have been to use the plate as the bottom and make all your holes in the plastic opposite the plate (<Smokey Behr>, 1.2.2012)

Remember, <Kevin Dady> framed his hack as a build diary – an account of how *he* made the analog joystick, which others may imitate to achieve the same results. But now the participants subject <Kevin Dady>'s account to rational scrutiny. Surely, as <Jeremy Pavlek> suggests, it makes more sense to raise the controllers on a platform than to file down the sides of the box. <Kevin Dady> replies with an artisan's sensitivity to the nature of materials: at that height, the box would flex under the pressure of "button mashing"(1.26.2012). This response "makes sense" to <Jeremy Pavlek>, whose objections are satisfied. But <smoky behr> pursues the point further: "you could have scrounged or (heaven forbid) bought some thicker material" (1.26.2012). Apart from the fact that this represents an odd return to mass-production in the context of a DIY project, a feature of the conversation that I further analyze below, it is significant that the participants subject <Kevin Dady>'s process to rational scrutiny. The

participant's comments have carried <Kevin Dady>'s hack well into the realm of technology, where every step of the process of making must be quick, cheap and reasonable.

And this turn to reason is key to understanding "Analog Joypad" in Mitcham's terms For those who remain optimistic about the transformative potential of extra-institutional technical communication, it would be tempting to read the exchange between <Kevin Dady>, <Jeremy Pavlek> and <smoky behr> the opposite way: by challenging <Kevin Dady>'s instructions, the participants resist the idea (which Mitcham associates with technology) that the processes of making can be taught. However, the participants do not try to invent multiple processes for building a thumbstick or critique the results of multiple builds. Instead, they use technical communication alone to converge on the best process: a process that "make(s) sense" (<Jeremy Pavlek>, <BluRY>), uses parts that are "much more suited to the task" (<derpedoo>) and places the buttons "more flush with the lip on the box" (<smoky behr>) – all without building anything. The concept of the thumbstick (which is itself an artifact of mass-production) never passes through this language-based proving ground; only the human activity of making must catch up to technology by becoming just as quick, cheap and reasonable as the thumbstick controller for Choplifter.

Mass Production and Aesthetic Disorientation

As described above, the rational control <Kevin Dady> wielded over the analog joypad was limited in scope: he endeavored to teach the build through a simple step-by-step tutorial. But the Hackaday.com participants attempted to seize this rational control for themselves, questioning <Kevin Dady> at every turn instead of simply following the

tutorial. Now, <Kevin Dady>'s tutorial is itself subject to rational critique; the participants move to challenge and discard steps, replacing them with their version of the definitive instructions.   And from the rational perspective of the participants, <Kevin Dady's> approach to build materials is a prime target for critique. In the original build, <Kevin Dady> limited himself to parts he could "scrounge" instead of buying select parts; therefore, <Kevin Dady>'s build decisions had to take the properties of "scrounged" materials into account. For example, when <Jeremy Pavlek> asks <Kevin Dady> why he did not use washers to increase the height dimension of the box <Kevin Dady> replies "the plate is not thick enough to support any pressure (like mashing buttons) so when I added washers it would flex in the middle". In other words, sensitivity to the materials at hand was a principle of <Kevin Dady's> build.

But participant <smoky behr> further challenges <Kevin Dady>'s approach: "You could have scrounged or (heaven forbid) bought some thicker material that would have been able to stand up to the stresses of button mashing" (3.3.2012). Two new axioms drive <smoky behr's> comment : first, that "scrounged " parts are so readily available that <Kevin Dady> could choose among them, and second, that buying parts is also acceptable. In either case, <Kevin Dady's> responsiveness to the properties inherent in build materials becomes passé. Thanks to mass-production and the waste it generates, materials are abundantly present in the environment to be "scrounged" or (heaven forbid) bought. With so many options at hand, "sensitivity" to the properties inherent in any particular material seems unnecessary, even sentimental.

It is not surprising that <smoky behr>'s attitude toward build materials soon becomes the dominant theme of the conversation as participants chime in to suggest material substitutions or discuss alternatives:

Cool project but those buttons/switches have got to go!

i like the other posters idea of reusing the NES or SNES controller buttons, or maybe even happs micro switches if theyd fit in that shallow depth (<Derpedoo>, 1.26.2012).

Can anyone point me to a cheap source for thumbsticks? For whatever reason, the joysticks (that I can find) on digikey start at 60 bucks and climb past 100 bucks (<Nutrino>, 1.26.2012),

I'd think the easiest way would be from a computer game shop, look for an old pad for whatever obsolete console, and cannibalize them. You could even use the casing, if you're imaginative (<Greenaum>, 2.8,2012).

http://search.digikey.com/us/en/cat/potentiometers-variable-resistors/joysticks/262970?k=joystick (<Kevin Dady>, 3.11.2012).

Why make buttons when buttons are readily available in Nintendo controllers – and, moreover, why build a joystick from scratch when joysticks can be easily purchased – or "cannibalized". Interestingly, as the conversation turns from building a joystick from scratch to patching one together or shopping for one, <Kevin Dady> does not object – in fact, he re-enters the conversation to suggest a cheap source for ready-made thumbsticks. While it is clear from the introductory paragraphs of <Kevin Dady>'s hack

that he holds ready-made thumbsticks in low esteem, it is also clear that he is in no position to re-assert this point. Once the conversation turns to rational critique of the individual steps of <Kevin Dady>'s hack, critique of the concept itself – i.e., building a thumbstick from scratch even though thumbsticks can be readily purchased – is inevitable.   And while <Kevin Dady> responds point-by-point to the critiques of his method, he can never satisfy his critics with an overarching rationale for the hack itself.

After all, <Kevin Dady>'s decision to build the analog joystick was based on something inherently irrational – his nostalgia-driven will to faithfully reproduce the conditions of an old-school Apple IIpc game.

However irrational this nostalgic will to return to childhood games may be, it was the organizing principle that motivated <Kevin Dady>'s build. Without this organizing principle, the conversation lapses quickly into what Mitcham would have called "aesthetic disorientation" (a term that Mitcham never fully defines; aesthetic disorientation is compared to "decomposition" (see p.117)) . The participants, who do not feel <Kevin Dady>'s desire to faithfully reproduce the conditions of Choplifter, breezily imagine new hybrids of game systems, buttons and controllers:

Looks sweet! I wonder if you could fit an xbox joystick in an nes controller, or use NES buttons in your controller (<Skitchin>, 1.26.2012).

Can this be modfied for Pan/tilt motion(with existing components and build) for motorized video camera base?(<Praetor>, 1.26.2012)

i like the other posters idea of reusing the NES or SNES controller buttons, or maybe even happs micro switches if theyd fit in that shallow depth. they seem

much more suited for the task, and of course give you that familiar feel.(<Derpedoo>, 1.26.2012)

Bonus points for connecting the Atari-style joystick ports on the 8-bits up to USB too, so you can have 2 sticks and a keyboard for your emulating needs! Once you have that, I suppose just stick a Raspberry Pi in it, and you can have an entire computer in there, emulating itself! (<Greenaum>, 3.12.2012)

The participants quoted above certainly agree with <Kevin Dady> on the value of thumbsticks – and they appear to be aesthetically concerned with the "look" and "feel" of a thumbstick build. But what is absent is <Kevin Dady>'s organizing principle: the nostalgic desire to replicate the Apple II thumbstick. Instead, the participants engage in combinatorial free-play: an Apple II thumbstick with SNES buttons, motorized camera base, a computer that emulates itself.

Conclusion

As exemplars of extra-institutional technical communication, "Stop Using Glue or Tape" and "Analog Joypad" share much in common: both represent end users' successful attempts to modify technological artifacts, and both attempt to disseminate these modifications to others via direct instruction in the form of online technical communication.

However, it is in the interactions between the authors of the instructions and other site participants that key differences emerge. In Mitcham's terms, the members of the Lace Fronts forum are thinking-through technology: specifically, the technology of Lace wigs. Instead of engaging in a relentless search for the *best* adhesive and

perfecting its application, <Tootsie> advocates "taking a break from all the glues and tapes" to contemplate the hazards of adhesives and the possibility of an adhesive-free technique. Here, techne is the dominant mood: <Tootsie> merely offers the idea or concept of glueless application and then allows the members to proliferate various techniques. She does not exert control (rational or otherwise) over this proliferation of techniques, but merely observes and comments on the process. In contrast, the "Analog Joypad" participants think *through* technology: the experience of playing Choplifter is reduced to the now-defunct Apple IIpc thumbstick, and this thumbstick itself is reduced to parts and components that can be reassembled with "only a little math". Technology, not techne, is the dominant mood: It is ironic that an erstwhile mass-produced artifact (i.e., the Apple IIpc thumbstick) serves as the eidos for this hack; and once participants understand how to (re)create this particular artifact, they discard even this eidos and imagine combining game components from disparate systems to achieve new gamepad configurations.

As technical communication increasingly involves networked writing in multimedia, these examples illustrate the limits of what can and should be taught in a user-centered model of technical communication. Unquestionably, users go online to search for foolproof step-by-step instructions with pictures and video – and these instructions can help users execute specific tasks. But, as we have seen in "Analog Joypad", step-by-step instructions also foreclose purposeful innovation; the participants on this thread imagined alternatives to <Kevin Dady>'s model, but produced nothing. Member <Tootsie> offers an alternative model that is closely aligned with Mitcham's *techne*: she proposes the idea (eidos) of a glue-less method, and allows members to

generate novel ways of executing it. Throughout this process, members think-through technology, refiguring the destructive cycle of adhesive application with a glue-less method that takes users' everyday lives and their well-being into account. "Stop Using Glue Or Tape" is user-centered, not user-friendly; and <Tootsie>'s role as the original author of the thread is to teach Lace Fronts forum members to recognize this distinction.

CHAPTER 5

In this brief chapter, I return to the two research questions that motivated this study: 1) "What do extra-institutional technical communicators do?", and 2) "Is extra-institutional technical communication necessarily more user-centered than traditional forms of documentation?" Finally, I address implications for research, practice and pedagogy.

What do Extra-Institutional Technical Communicators Do?

To return to my original research question, what do extra-institutional technical communicators do? This dissertation has uncovered one simple, comprehensive answer: they write. Previous research in traditional technical communication has already established that writing plays a marginalized, though integral role in traditional organizations. Although the life of an organization consists of a "documentary reality" (Dobrin), technical writers themselves exist "on the periphery of the 'real work' that they will merely write up and edit" (Kynell-Hunt and Savage, 2003, p. 218; see also Jayeraj, 2004). Regrettably, technical writers in traditional organizations are not present at every stage of the design process, and their writing, once it is produced, is chronically undervalued (see, for example, Johnson p. 115-153).

To a much greater extent than in industry, the extra-institutional sites I studied foreground writing. Here, texts are the main focus of attention and action; as Chapters 2 and 3 illustrated, participants spend more time generating and commenting on one another's' writing than they spend directly modifying technology. But as Chapter 4 illustrated, Hacakday.com and the Lace Fronts forum are not all talk; on both sites, hacks, tips and tutorials do punctuate the daily flow of interaction and commentary. And

nor is all this writing undervalued. Most extra-institutional sites such as Hackaday.com and the Lace Fronts forum are for-profit ventures, and these sites frequently introduce questions, contests, prizes and promotions to generate as much traffic and participation as possible – and, in the digital world, participation means writing. From the perspective of the Blackhairmedia.com and Hackaday.com owners, it does not matter whether communication on the site focuses on hacks and lace fronts or digresses into off-topic commentary and flaming. All that matters is that visitors enter the site, see the ads and generate content. In this respect, the world of extra-institutional technical communication reflected in my sites diverges from the world of technical writing in industry.

This link between participation and writing is key to understanding technical communication in extra-institutional sites. At first glance, much of the communication on Hackaday.com and the Lace Fronts forum appears extraneous – members seem to spend more time commenting on posts and even insulting each other than they spend generating ideas. But in the digital world, where writing and participation are equivalent, the writing that is generated on a site is a direct index of participants' level of participation in the community. Anyone may *lurk* in an online forum, but only those who take the risk of posting (i.e., writing) on the forum can become sufficiently enmeshed in the community to attain insider status.

However, the reverse is also true: For the first time in the history of technical communication, users who cannot post their writing online run the risk of becoming marginalized as technological outsiders. Before the advent of sites and forums dedicated to technology, users needed only to read a manual to obtain technological

information. But now, online technology sites are surpassing traditional manuals in relevance and popularity.   Most of these sites are not strictly extra-institutional; most blur the theoretical boundary that separates traditional institutions from extra-institutional technical communication. For example, establish institutions such as Sears and Apple now sponsor online user forums or "support communities" (see, for example, mytractorforum.com and discussions.apple.com).   Although these sites ostensibly exist "to enable community members to help each other" (see discussions.apple.com, "community etiquette"), they primarily serve the institution by placing the burden of technical support on users instead of paid personnel.   Sites such as Blackhairmedia.com and Hackaday.com blur the institutional boundaries even more; these sites are not affiliated with established institutions and do not attempt to control or delimit technological activity; instead, they are for-profit enterprises that receive revenue from site traffic and advertising. These online sites do extend users' access to a wider range of technological information than they may find traditional manuals.   But along with the for-profit motivations that drive traditional industry, the face of industry always looms here: in advertisements, in discussions about specific products, and as paid representatives of specific organizations who visit online forums to promote their products.

To obtain the most current and accessible information about how to use technology, users must now increasingly go online and encounter this strange mix of user-driven dialogue and for-profit advertising that makes up the world of online technical communication.   These encounters range from a brief click-in to full immersion in an extra-institutional site or "support community". As shown in my analysis of the Lace

Fronts forum, the ability to conduct a simple Web search for information is often not enough. For many extra-institutional sites, and many technologies, one must *participate* to obtain information. Furthermore, this participation often cannot be reduced to a quick post requesting information; on the Lace Fronts forum, such naïve posts by outsiders were largely ignored or moved to the "newbies" section (where they were again largely ignored). In fact, many sites such as the Lace Fronts forum have technological constraints prohibiting new members from posting a thread. By itself, traditional technical writing fails here – questions from new members, no matter how well-framed, clear and concise they may be, are generally deleted, moved or ignored. In the online world, obtaining technical information also requires users to demonstrate some level of phronesis or prudence: users must establish an online presence and participate in the flow of activity. Since Aristotle, we have known that action, unlike making, has no end outside itself for "good action itself is its end" (Nicomachean Ethics, VII, Ch 2). But on the lace fronts forum, good action was both a community-building end in itself and a prerequisite to obtaining information about the techne of making and modifying wigs; I refer to this prized ability to obtain technical information as *phronectivity.*

Therefore, technical communication scholars have reason to take users' seemingly extraneous commentary seriously. On extra-institutional technology sites, even the most nonsensical posts represent acts of participation. Nor can these acts of participation be reduced to the concept of *ethos* or credibility as it is taught in mainstream technical communication textbooks (see, for example, Markel, 2012, p. 376 and 491) – users do not always attempt to build stable and credible online identities. Certainly members of the Lace Fronts forum did attempt to build insider status and

demonstrate this status in their posts. But on Hackaday.com, readers may leave anonymous comments without completing a forum registration and user names are not necessarily stable; readers may change handles and invent alternative identities at will. But here, commentary still plays a central role; a particular comment may not build credibility for any particular member, but it can still pose questions and shift the flow of conversation.

Furthermore, on Hackaday.com these comments engaged with the cultural context of technology in a way that traditional technical communication often cannot they link technology to science fiction, ponder philosophical problems and provide comic relief. As explained in Chapter 2, I associate this cultural awareness with Heidegger's concept of meditative thinking, which involves contemplating the meaning of technology from multiple perspectives. Drawing on Aristotle's concept of techne and Heidegger's meditative thinking, I refer to this contemplative thinking about technology as technitation. In brief, technitation is the embodiment of meditative thinking in technical communication. However, unlike techne, technitation does not stop with end use by the user in context; it extends to speculation about long-range outcomes, humor and fantasy. Arguably, because user-centered theory reorients technical communication toward end use by the user, technitation is an extension of user-centeredness beyond the immediate context of use and into the philosophical and cultural dimensions of the user's lifeworld. For example, on the "Laser Tattoo" thread I analyzed in Chapter 2, comments helped to plot out the long-range implications of the laser tattoo device for potential users. On another thread titled "Dirk's Accident", readers told tall tales about magnets to symbolically wrestle with the problem of technological versus human power.

Often reader comments meditate on philosophical problems related to technology. Because phronectivity and technitation both emerge from seemingly off-topic or nonsensical comments on extra-institutional sites, these concepts offer a powerful rationale for taking seemingly extraneous commentary seriously.

For extra-institutional technology sites, perhaps geographical remoteness is itself an affordance. Participants cannot directly observe one another's' activities, but they must nonetheless participate to obtain information. So, the focus of activity on the sites conspicuously shifts from doing to writing – and this writing does important cultural work that traditional technical communication (in its current embodiments) often cannot do. After all, such in-depth exploration of cultural and philosophical problems requires a pause in technological production during which participants mostly write – and, in their writing, wander off-topic from direct technological production. Such a pause runs contrary to industrial capitalism, which aims to produce as many widgets (tangible or symbolic) as possible. Although traditional organizations may attempt to co-opt online media such as forums and blogs, these corporate forums and blogs are unlikely to do the same work. If traditional technical communication is an embodiment of the calculative thinking described by Heidegger, extra-institutional technical communication represents a pause for meditation – a unique pause that cannot be co-opted for industrial ends without significant distortion.

This is not to suggest that extra-institutional technical communication is anti-capitalist. Much extra-institutional technical communication does generate profit. The for-profit nature of the sites I studied was not immediately obvious; it is clear from the URL that the Lace Fronts forum is part of Blackhairmedia.com, but only the

inconspicuous "About Us" page identifies the site as a for-profit enterprise with a traditional CEO structure (par. 4). Advertisements, the emblem of capitalism, generate most of the site's revenue and are the most prominent visual element on any page. The only difference between Blackhairmedia.com and a traditional technological organization is that it exists at a remove from the sites of technological development. Blackhairmedia.com does not produce lace front wigs; it produces writing about Black hair. Any writing about Black hairstyles that generates traffic is profitable; the owners have no financial investment in lace wigs, weaves or any Black hairstyle in particular. While the ethics of profiting off of users' unpaid writing are questionable at best, Blackhairmedia.com does foster writing about lace front wigs that is not under the direct control of the wigmaking industry.

Or is it? Many industrial wigmakers are listed under the "sponsors" page of Blackhairmedia.com, and wigmakers do patrol the forum and attempt to assert their views on wigmaking methods and wig care. Advertisers' influence on content is even more apparent on Hackaday.com, where the contributors offer so many hacks featuring the Arduino circuitboard (which is also prominently advertised on the site) that readers sometimes accuse the site of covertly promoting Arduino. But even here, Hackaday.com is operating differently than traditional technical communication: Arduino may have a voice, but it is not the only voice. Participants can (and often do) criticize the role of widely advertised hacking technologies like the Arduino and offer alternatives, including alternatives that are free of cost. A more aggressive form of this pushback from users against advertisers is seen on the Lace Fronts forum, where members attack Chinese wigmakers who use forum posts to promote their products.

On these sites, users have the loudest voice – after all, they are the site's source of free labor. In the case of extra-institutional online writing, site traffic and profitability depends largely on users' willingness to generate a large corpus of writing for free.

To borrow an apt phrase from Spivak, these two opposing forces – users and institutions – "go a long way to legitimize each other" (see "Can the subaltern speak?", p. 93). To create user-centered technology, users must reorient technological discourse to represent their own interests – but the more users write online, the more they expose themselves to institutionalized norms (i.e., through advertisements and representatives) that dictate what interactions with technology should look like. But these long-reaching extensions of industry, though powerful, are always bound by the norms they promote, and it is within this asymmetrical power relationship that unconventional moves like trolling, flaming, secrecy and silence offer users leverage and power.

Are extra-institutional sites inherently more user-centered than traditional technical communication?

To return to my second research question, are extra-institutional sites inherently more user-centered than traditional technical communication? The simple answer to this question is no: extra-institutional sites need only produce writing to survive, and there is no guarantee that this writing will not simply replicate and extend a traditional corporate agenda. The risk that these sites will replicate the corporate agendas is especially high given the close involvement of industry outlined above: industries may not directly control extra-institutional sites, but they do advertise and intervene in extra-institutional conversations. At any given time, traditional corporations may attempt to muffle users' voices and promote their own for-profit agenda.

But, as illustrated above, user-centeredness is more complex than simply talking about technology; it requires a community structure wherein agency "is openly shared" (Johnson, p. 165). Even if it were possible for users to talk online about technology without the intrusion of institutional presences, there is no guarantee that these users would spontaneously produce user-centered technical communication. To illuminate this problem, I turn to a recent article on extra-institutional technical communication whose findings differ substantially from mine (Morain and Swarts, 2012). By comparing Morain and Swarts's findings point-by-point to mine, I illustrate two interrelated problems: because traditional technical communication still has a limited understanding of users and their activities, concepts from traditional technical communication are not extensible to research in extra-institutional sites.

Academic investigation of extra-institutional technical communication genres has been motivated by the sheer volume of this communication that has emerged online – as loosely aggregated eHow and YouTube tutorials, and as the more specialized technological communities examined in this dissertation. Some recent technical communication research has acknowledged this new user-generated technical communication – and has tried to evaluate it. In a recent example, Morain and Swarts (2012) develop a rubric for assessing online tutorial videos by identifying highly rated YouTube videos and analyzing their features. According to Morain and Swarts (2012), users view and imitate these videos as "patterns of use" (p. 9); accepting users' patterned imitation as a "goal", the ideal tutorial video should focus on relevant actions (accessibility), have tolerable image and sound quality (viewability) and pace the instruction (timing) (p. 9). Morain and Swarts's (2012) rubric assesses these three

dimensions of online videos; the end purpose of the rubric is to "contribute to the creation of online video" (p. 17).

Alongside academic and professional assessment schemes such as the rubric developed by Morain and Swarts, the online world has generated its own systems for evaluating content. These systems vary from site to site and even within sites. For example, YouTube displays several indexes of a video's effectiveness. The prominent visitor count measures traffic to a video, whereas the proportion of likes to dislikes (displayed as a simple bar graph) measures viewer responses. In addition, viewers may respond qualitatively by commenting on a video and others may like or dislike each individual comment; likes and dislikes are displayed to the right of the comment. With the exception of the comments, these are quantitative indexes that measure traffic and popularity -- these measures cannot identify whether a particular tutorial is safe, culturally beneficial or user-centered.

Instead of ignoring these pre-existent online assessment systems, Morain and Swarts incorporate YouTube's own measures of effectiveness into their analysis.   The video tutorials that Morain and Swarts analyzed employed YouTube's old five-star rating system, discontinued in 2010, which allowed viewers to rank videos as good (4-5 stars), average (3 stars) or poor (2 stars and below). Morain and Swarts's findings suggest that videos ranked as good have features that foster patterned imitation (broadly: accessibility, viewability and timing). From these broad features and more specific features of the videos, Morain and Swarts extrapolate best practices for instruction and industry.

From the perspective of traditional technical communication research, there is nothing surprising about Morain and Swarts's study; certainly, online tutorials should be accessible, viewable and well-paced. But what is absent from these prescriptions is an appreciation of the role that users (in this case, the viewers of the videos) can play in technological development. Following Johnson's categories, users may participate in technological development as idiots who follow instructions, as citizens with a voice in how technology is developed or adapted, and as producers who re-make technology to their own ends. If Morain and Swarts's participants are indeed using the YouTube tutorial videos to achieve the goal of patterned imitation, these users are playing a limited role as users-as-idiots – and Morain and Swarts's rubric can only assess whether a video fosters the narrow goal of enabling users to play this role. And this narrowing of goals has far-reaching implications. If academic technical communication succeeds in "contribut(ing) to the creation of online video", it may do so by inadvertently limiting the roles that users can play on extra-institutional sites.

Certainly, accessibility, viewability and pacing are sound principles for any technical communicator writing online or in industry. But a closer read of Morain and Swarts's report reveals some interesting contradictions that divide their findings and mine. The first contradiction concerns the centrality of video itself. Morain and Swarts point to a new generation of students who have migrated from text-only writing to (often vernacular) multimedia.   Within these multimedia, YouTube is a "natural" medium for instructional content and technical communication should "embrace" it (p. 6). This optimistic view places video at the center of extra-institutional technical communication research, although the authors do acknowledge that some online videos are of poor

instructional quality. But for the sites I studied, video played a non-instructional role. On Hackaday.com, two posts used video to prove that the hack was successful: "Laser tattoo" included a video of the laser tattoo device etching designs onto a hand, and "Analog joypad" included a video of the thumbstick in use. Neither of these videos incorporates instructional content that shows how to achieve these results; for both hacks, the instructions are text-only. And the members of the Lace Fronts forum seem to actively resist video. In "So You Want a Throwdown, Do You", the "hairline throwdown" was text-driven; images must not interrupt the flow of the text, hence the demand for staged single-shot photos and the members' resistance to outclicks. For "Stop Using Glue Or Tape" the original author <Tootsie> conspicuously ignored requests for a video tutorial; such a tutorial would have invited members to imitate <Tootsie>'s methods as a lockstep process, when <Tootsie> wanted to encourage innovation. In all of these threads, video played a peripheral or nonexistent role; for the lace fronts forum, video would have detracted from the members' goals. Indeed, some extra-institutional technical communication is video driven – but we must stop short of privileging video as a "natural" mode of instruction.

Perhaps because of this limited understanding of what users do, Morain and Swarts are optimistic about the generalizability of their findings. While acknowledging that it is never possible to extrapolate best practices from one or two sites, the authors assume that principles of good YouTube video production can extend to tutorials in other media:

First, this research extends to different media work in technical communication on

the best practices of procedure writing (see Farkas,1999; van der Meij et al., 2009).

It may not surprise anyone to learn that many of the qualities that make instructional

videos good are the same qualities that make good written procedures: clear goals, a structure that supports reading to do, concrete details, and user feedback. Second, our research demonstrates the continued applicability of that prior research while offering an explicit way to understand how content in different modal forms (text, sound, video) contribute to (or hinder) the instructional intent. I (p. 17)

To summarize Morain and Swarts view, prior (i.e., traditional) technical communication research is extensible to extra-institutional sites. In turn, according to the authors, findings from research in one extra-institutional medium can be extended to writing in other media and even back to traditional technical communication as the new innovations inform text-based practices.

However, my findings suggest the opposite. First, as illustrated above, Morain and Swarts's assumptions about good technical communication do not always hold true in extra-institutional sites; these assumptions are not universally valid across sites and situations. Second, technical communication on extra-institutional sites is imbued with local character; practices that work on one site are often not transferrable to other sites. In the present study, members of the Lace Fronts forum differed substantially from members of Hackaday.com; for example, African-American Vernacular English (AAVE) strongly influenced the structure and content of communication on the Lace Fronts forum, while on Hackaday.com metaphors from science fiction predominated. Because traditional technical communication frequently assumes that all communication is written in Edited American English (EAE) for the purpose of communicating about technology to a wide range of potential users, concepts from traditional technical communication are often not extensible to in extra-institutional sites.

But are these extra-institutional sites necessarily more user-centered, just because they are so diverse? To answer this question, I return to Johnson's original multidisciplinary question: "What is the relationship of human beings to technology?" As for the particular human beings I studied, they certainly do reshape technology in the context of use. In the "mundane" or everyday lifeworld of the participants I studied (cf Johnson, p. 3), printers become tattoo machines and wigs that were originally developed for theater become part of a real-life illusion. Because both of these cases reshape technology in the context of use, both create user-centered technologies in this sense. But <Tootsie>'s glueless method and the analog joypad are not merely technologies in their own right; they are also literally texts, disseminated to users not as physical widgets but as hacks and tutorials online. Whether these texts allow users to develop a unique relationship with the technology and a sensitivity to the "desire" of the materials at hand (as in the case of "Stop Using Glue Or Tape), or they simply teach the imposition of the user's will on the build materials (as in the case of "Analog Joypad") shapes. the ultimate outcome: users who encounter these texts will become idiots, experts, or producers of new technologies in their own right. If technical communication scholarship endeavors to maintain a user-centered perspective, then it is these aspects of the documentation – and not accessibility or pacing – that we should closely examine.

Conclusion: Implications for Research, Practice and Pedagogy

Just because extra-institutional technical communication may appear less homogenous than traditional technical communication does not mean that it is un-researchable – or that findings are so isolated that they may never be applicable across

sites and situations.   On the contrary: extra-institutional sites are becoming an integral component to users' interactions with technology; when these sites demand participation (i.e., writing) in exchange for information, users become technical communicators.

Understanding that users' technical communication online encompasses a wide range of activities, technical communication research should attempt to view all of users' activities (even trolling, flaming and other undesirable actions) in the context of technology use. Yes, users may find a YouTube tutorial *accessible* – but would such a tutorial cut off the possibility of user-generated innovations? Conversely, anatomical magnet accident stories may seem distracting (or even juvenile) – but do such stories allow users to work out their philosophical relationships with magnets? And, of course, who *profits* from all this talk about technology – does the site itself prompt so much participation that the users' technical communication becomes cluttered with irrelevant posts? And how do users work out their relationships with the owners, advertisers and moderators who participate on each site for-profit?

As technical communication research takes on these questions, implications for practice and pedagogy ensue. First, we must acknowledge that extra-institutional sites recruit increasing numbers of users as participants and, ultimately, technical communicators – again, often for-profit. Therefore, to the extent that participation on these technology sites is becoming widespread (at least in North America), we are all becoming practitioners of technical communication in everyday life.

While these new trends offer a sound argument for the centrality of technical communication, a universal undergraduate technical requirement is sadly unlikely. But

we can prepare those students who do enroll in the technical communication sequence not only to read and write documentation at work, but also to transform technical communication in extra-institutional sites. One striking characteristic of the sites I analyzed was the potential for a small group of participants to radically transform an online conversation about technology – or the technology itself. While no easy formula exists to create user-centered technical communication, students can be taught to push online conversations about technology in a user-centered direction by raising questions about long-range consequences of the relationships among technology and humans. Of course, any participant can *enter* an online conversation. But the ability to transform one requires understanding the genres and dialects that structure communication on a site – and a rich (not superficial) understanding of the user-centered ideal that extra-institutional technical communication can (but does not always) achieve.

Of course, on the sites I analyzed, conversations about technology were not transformed into user-centered critique by on-topic responses in Edited American English (EAE). The most transformative posts were strikingly unconventional in their approach to technology (i.e., Tootsie's glueless application method) or writing (i.e., <fuzzmanmatt's> troll) , while displaying awareness of local discourse conventions and the pace of conversation on the thread. Most talk about technology is not user-centered or is only superficially so, even in extra-institutional sites; therefore, participants had to venture far outside of traditional genres to call attention back to users and their world. For now, this use of nonstandard dialects of English and unconventional genres exist on the fringe of what we consider technical communication. But the situations in which my participants found themselves are becoming increasingly characteristic of contemporary

technology: technical information is increasingly online, and technical production is increasingly offshore; as more local communities achieve Internet connectivity, more dialects and genres of English meet and intermingle at the sites of talk about technology. Ultimately, what extra-institutional sites offer is not increased access to information but a backchannel of reconnection between the users and producers of technology, a blurring of these boundaries through interaction, and the eventual collapse of these two roles into one.

Appendix A

Code-switching on the lace fronts forum: Case study (<Ashleysmom>)

Author	AAVE	Edited American English
<Ashleysmom>	Oh no u nutbies didn't go there with me (8.9.2009)	If I see an out of control shine, I may put a little cornstarch or baby powder to soak up some of the oil and then blot out any residue. (6.30.2009)
	You know that's right <femmmystique> (8.10.2009)	
	LAWD HAVE MERCY (8.10.2009)	Appreciate the kudos from everybody who gave them. Hopefully this will spark your interest. Anybody can ventilate if you want to learn. It's not hard. It just takes a little practice. (6.23.2009)
	They are about to get some of my money cause the photos of alleged actual work has a sistah girl about to break em off something. (8.20.2009)	
		Use your best judgment with every transaction. Ask for a listing and use paypal if you can. I am not promoting any particular vendor. (8.20.2009)

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ABSTRACT

WIRED & DANGEROUS: HACKS, HAIR EXTENSIONS AND OTHER TWISTS ON TRADITIONAL TECHNICAL COMMUNICATION

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August 2012

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Ever since its inception as a "humanistic" research discipline (Miller, 1979; Dombrowski, 1994), technical communication has striven to balance workplace exigencies with attention to the broader rhetorical, social and ethical issues within which technical communication is situated. Recently, this humanistic agenda has expanded from a simple awareness of contextual factors surrounding work (see, for example, Collier and Toomey, 1997) to calls for technical communication research in non-workplace and other non-traditional sites. Frequently these calls for "extra-institutional" research (Kimball, 2007) are driven by the assumption that users' indigenous technical communication is inherently more user-centered - and therefore more democratic - than the more traditional technical documentation underwritten by corporations (see, for example, Johnson, 1999; Kimball, 2007). This dissertation articulates and challenges our field's assumptions about the revolutionary nature of extra-institutional documentation. Drawing on Aristotle's broad classification of `habits of mind' or modes

of inquiry outlined in the Nicomachean Ethics, as well as Johnson's user-centered theory, this dissertation examines 2 extra-institutional sites in which users generate and organize their own technical documentation: Hackaday.org, a hacker database consisting of an intertextual network of hacks (which are short step-by-step instructions for hacking), and Black Hair Media, a virtual DIY hair extension community with an explicitly Afro Centric twist. Retaining characteristics of traditional proprietary technical communication and the "malleable, animated and visually complex" forms of communication associated with virtual communities (Bolter, 1991, p. 26), these two extra-institutional sites illuminate ways that knowledge and power are negotiated in digital spaces that lack a centralized regulatory power.

AUTOBIOGRAPHICAL STATEMENT

Hilary Sarat-St Peter is a doctoral student at Wayne State University. She began her academic career as a psychology student and obtained her bachelor's degree in this area (St Mary's College, 2002), but she soon realized that she is more interested in studying writing than people. Fascinated with psychology's elaborate system of codes and documents, she entered WSU's Composition and Rhetoric program to study how scientists other professionals communicate to shape our society. But throughout her career, Hilary became more aware of the role of *non*-professionals in shaping professional practice; patient groups, for example, have shaped whether and to what extent autism is classified as a psychological disorder. For her dissertation project she studied a widely recognized form of technical and professional communication: hackers and other non-professionals on extra-institutional online sites. Her future research will incorporate non-professionals who interact more directly with professional culture, including science students, patient groups and religious organizations. Hilary is also an avid practitioner of wigmaking, a techne that requires a flexible attitude toward technology and sensitivity to the requirements of end users.