Guest Editor's Introduction: Technical Communication in the Age of Distributed Work

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In this introduction, I review the topic of the special issue, distributed work: coordinative, polycontextual, cross-disciplinary work that splices together divergent work activities (separated by time, space, organizations, and objectives) and that enables the transformations of information and texts that characterize such work. After reviewing the literature on distributed work, I introduce the articles in this special issue.

"In the past," Nardi, Whittaker, and Schwartz tell us, "much work took place in relatively stable settings" (2002, p. 205). In these settings, long-term relationships flourished; workers held long-term or lifelong jobs, maintained steady contacts with other organizations and with the public, and built up considerable expertise (cf. Braverman, 1974). They fulfilled clearly defined roles and developed strong working relationships. They "shared considerable social, cultural, and organizational knowledge that served as a backdrop for work and interaction" (p. 205). These characteristics foregrounded "vertical" expertise (Engeström, Engeström, & Kärkkäinen, 1995) in which learning happened within a particular domain: a particular activity, discipline, field, or trade carried out in a particular setting.

But these stable settings have been destabilized by recent changes in work: downsizing, automation, flattening of work hierarchies, increasing numbers of relationships between companies, continual reorganization, the breaking down of silos or stovepipes in organizations, and perhaps most importantly, the increase in telecommunications (phones, faxes, Internet connections), which has made it possible to connect any one point to any other, within or across organizations (Nardi et al., 2002, p. 206; cf. Alberts & Hayes, 2003; Deleuze, 1995; Engeström, Engeström, & Vähääho, 1999). One result, Nardi et al. say, is that "many corporations operate in an increasingly distributed manner, with workers, contractors, consultants, and important contacts such as those in the press located in different parts of the country or across the globe" (p. 206; cf. Zuboff & Maxmin, 2004). Such organizations are inter-

penetrated: Anyone can link up with anyone else inside or outside the organization, and consequently any number of work activities can be intersected. Another result is that constant flux leads to constant learning across boundaries: Vertical expertise is accompanied by horizontal expertise (Engeström et al., 1995) characterized by learning *across* boundaries, including organizations, activities, disciplines, fields, trades, and settings. Such learning is characterized positively as lifelong learning (Drucker, 2003; Zuboff & Maxmin, 2004)—and negatively as continual deskilling and reskilling (Ehn, 1989; Haraway, 1991).

Let us call this distributed work coordinative, polycontextual, crossdisciplinary work that splices together divergent work activities (separated by time, space, organizations, and objectives) and that enables the transformations of information and texts that characterize such work. Distributed work has been noted in scholarship focusing on what is variably called the new economy, the knowledge economy, the control society, the politics of informatics, the support economy, and the hyperlinked organization. These phrases—though often employed shallowly, as buzzwords—attempt to describe the fundamental shift in work organization away from the stable, rationalized, modular work structures that characterized the Industrial Revolution and toward less stable, more interpenetrated work. And it is these interpenetrations that concern us because they involve more communication, more and different types of communication, and consequently more need for rhetorical analysis and rhetorical skill.

The links between work structures, technologies, and communicative practices have been noted frequently in the literature. For instance, Yates's (1989) book *Control through Communication* describes how railroads in the late 19th and early 20th century used memos, filing systems, and other communicative practices to enact the centralized control of operations that was demanded by the railroad's hierarchical organization. Her study was inspired in part by the work of Beniger (1989), who notes how information technologies enabled modular work across multiple industries and how the spread of telecommunications and digital technologies allowed new levels of control in those industries. Similar phenomena were noted in Zachry's (2000a) study of the meatpacking industry, in which influxes of new technologies and genres enacted new forms of centralized control. In a different context, O'Leary, Orlikowski, and Yates (2002) describe how a much more decentralized organization—the Hudson's Bay Company—mobilized independent agents through lines of communication that relied heavily on trust. In each case, work structures were supported with communication technologies and practices that involved different kinds of rhetorical stances and skills. The rhetorical skills needed by a centralized, hierarchical organization such as the railroad in Yates's study, for instance, were quite different from the ones needed in a distributed, far-flung organization such as the Hudson's Bay Company. And those skills, in turn, were quite different from the ones needed today: Currently, we face work structures that were hardly conceivable a few decades ago, and these work structures again require different rhetorical skills and communication practices.

And what work structures are these? Below, I discuss distributed work in contrast with modular work; briefly survey some technical communication research into distributed work; and introduce the articles of this special issue.

MODULAR WORK

By modular work I mean the understanding based on the arrangements that underpinned the Industrial Revolution and that have been the foundation for industrial and managerial capitalism. Karl Marx argues that manufacture takes two (modular) forms: heterogeneous and organic. Heterogeneous manufacturing involves bringing together separate streams of supplies to assemble a product (Marx, 1990, p. 461); organic manufacturing involves the same material being progressively transformed, allowing the different stages to be isolated and to yield a chained division of labor (p. 463) in which work that had been accomplished in one place, by one person, is distributed in space and time (p. 464). Marx argues that each modular form becomes crystallized into an exclusive function of a particular worker (pp. 456–457).

Both organic and heterogeneous arrangements involve a definite division of labor and a definite spatial-temporal progression: Work is encapsulated and developed, and manufactured products develop linearly by being moved from one station to another, from one job to another. Both are also highly managed, with line workers unable to see the overall shape of the product they are assembling. This arrangement leads to standardization of parts, materials, and actions. It also leads to deskilling, in which tasks are broken down into easily learnable and repeatable components, decision-making is reserved for management, and automation becomes prevalent. Marx was not happy about this arrangement, which led to worker exploitation (especially when a large pool of unemployed workers existed to feed the system), and surely he would have not been happy about the extent to which Frederick Taylor and other pioneers of scientific management developed the system.

A modular understanding of work involves separating activities and conceptualizing their relationships in terms of production and consumption, as process, a series of spatial and temporal moves that progressively develop the network's cumulative product. (Think of an assembly line.) Relations among activities are circumscribed, blackboxed (Latour, 1999), with links limited to maximize control and enforce the process. Workers are focused on their activity's specific product; they become specialized and are encouraged not to work outside their organizational boundaries (Alberts & Hayes, 2003).

This understanding of work leads us to expect singularity rather than multiplicity, monocontextuality rather than polycontextuality, handoffs rather than conver-

sations, vertical rather than horizontal development. Its underlying assumptions, its warrants, do not apply to distributed work.

DISTRIBUTED WORK

Distributed work is the coordinative work that enables sociotechnical networks to hold together and form dense interconnections among and across work activities that have traditionally been separated by temporal, spatial, or disciplinary boundaries. Networks, not hierarchies, are the dominant organizational form here (though one does not preclude the other, and hierarchies persist in distributed work). Distributed work is deeply interpenetrated, with multiple, multidirectional information flows. Yes, work may resemble a process, but this work is performed by assemblages of workers and technologies, assemblages that may not be stable from one incident to the next and in which work may not follow predictable or circumscribed paths. Under these circumstances, singularity (monocontextuality) is impossible to sustain at any significant scale; multiplicity (polycontextuality) is inevitable. Trades are not strictly delimited and neither are organizations.

Similarly, individuals are not delimited. A unitary subject, a singularity, is adequate if work is kept corralled in the heterogeneous or organic relationships that Marx describes and Taylor prescribes. But arguably, it was never quite sufficient for understanding even those circumscribed sorts of activities (Blackler, Crump, & McDonald, 2003). In addition, in an interpenetrated organization, in which every activity and every worker can be connected to every other, a unitary subject is entirely inadequate (Nardi et al., 2002, p. 207). Here we are faced with collective subjects, unstable subjects, "cyborgs" (Haraway, 1991) and "dividuals" (Deleuze, 1995).

In their book *The Support Economy*, Zuboff and Maxmin (2004) claim that we are on the cusp of a genuine paradigm shift, a true realignment of thought that takes place at most once a century. The last time this happened was the birth of managerial capitalism at the turn of the 20th century, when Henry Ford realized that you could satisfy consumers by making lots and lots of the same thing, as long as you made it very inexpensive. The essential enterprise logic led to the split between ownership and control: Ownership was distributed across many shareholders, while control was concentrated tightly in the hands of CEOs. This arrangement in turn led to what Zuboff and Maxmin describe as a "solar system" in which the company is at the center of everything, suppliers are in orbits farther out, and at the outermost reaches of the solar system are the customers. Customers might be given lip service, but ultimately they are forced to "contort themselves" and conform to the company's demands because, under this enterprise logic, the only way for the company to get ahead is to give everyone the same experience and to continue re-

ducing the costs associated with that experience. That is, the logic of the assembly line—the logic of modular work—is extended to consumption. As Henry Ford famously said, the customer can have a Model T in any color as long as it is black.

Zuboff and Maxmin, however, see the beginnings of a Copernican revolution that will reorient this solar system, placing the customers at the center. They envision a distributed capitalism in which control will be just as distributed as ownership—distributed across the customers, that is. Digital technologies are a necessary but not sufficient condition for this Copernican revolution. Other conditions include the individuation of consumption (i.e., the desire for unique identities and unique experiences—customers can have cars in whatever color combination they want—and aftermarket customization thrives); the consequent rise in relationship value; and the desire for deep support (i.e., stable beneficial relationships among consumers and producers that support these individual experiences). In this support economy, the existing enterprise logic is inoperative, supply chains are dismantled, and professional relationship workers called advocates assemble temporary federations (networks) of suppliers for each individual transaction (cf. Castells, 1996, pp. 154–168; Malone, 2004, p. 31). In distributed work, the emphasis shifts from predictable, monodirectional flows of information and services to unpredictable, multidirectional flows (cf. Boczkowski, 2005), and services and products are constantly adjusted or coconfigured:

> Co-configuration work occurs at the interface of the firm, the customer, and the products or services. It requires constant interaction among the firm, the customer, and the product. The result is that the product continuously adjusts to what the customer wants. Co-configuration creates customer-intelligent value in products or services, where the lines between product and customer knowledge become blurred and interwoven. (Victor & Boynton, 1998, p. 14)

Zuboff and Maxmin and other authors in this vein tend to present an optimistic, rosy vision of distributed work. Others are less sanguine about its implications. For instance, Deleuze (1995) argues that whereas the 20th century was primarily marked by disciplinary societies (in Foucault's terms), the 21st will be dominated by control societies. His description of control is the dark side of Zuboff and Maxmin's vision:

> the ultrarapid forms of apparently free-floating control that are taking over from the old disciplines at work within the time scales of closed systems. … With the breakdown of the hospital as a site of confinement, for instance, community psychiatry, day hospitals, and home care initially presented new freedoms, while at the same time contributing to mechanisms of control as rigorous as the harshest confinement. (p. 178)

Deleuze quite clearly sees this control society as a threat as bad as, perhaps worse than, the disciplinary society Foucault described. In the disciplinary society, factories produced a body of workers that could be controlled en masse by management, as well as an avenue of mass resistance via unions. However, whereas the disciplinary society was characterized by a linear, static, modular type of work (e.g., factories producing goods), the control society is a nonlinear, shifting, interconnected arrangement (e.g., businesses producing services). In the control society, individuals relate to each other, compete against each other, and their wages fluctuate continually, "bringing them into a state of constant metastability punctuated by ludicrous challenges, competitions, and seminars" (p. 179). (It is difficult to read this quote without thinking of reality shows such as *Project runway* and *The apprentice*, in which ludicrous challenges and competitions are used to judge the worth of people seeking opportunities in a given field.) The result is a sort of endless postponement rather than a defined avenue of development; workers travel in continuously changing orbits, they undulate, they find themselves switching jobs and careers and positionalities (p. 180). The factory is gone, as are unions and lifetime employment; the best way to get a raise is to switch jobs. Capitalism in a control society becomes distributed and essentially dispersive: "It's a capitalism no longer directed toward production but toward products, that is, toward sales or markets" (p. 181).

Deleuze sounds a lot like Haraway here, in her discussion of the informatics of domination: the systematic deskilling of workers and their resulting vulnerability; the homework economy in which the workday is no longer limited and work is no longer confined to the workplace thanks to new technologies; the decentralization of State power, with increased surveillance and control; and the massive intensification of insecurity (Haraway, 1991, pp. 161, 166, 171–172). Indeed, in shifting from monodirectional to multidirectional information flows and from limiting to proliferating links among heterogeneous entities, distributed work has shifted from the panopticon to the agora, which is to say, from surveillance by an authority figure to mutual, distributed surveillance and critique—as popular works have begun to highlight (Hewitt, 2005; Locke, Levine, Searls, & Weinberger, 2001; Reynolds, 2006). Black boxes are undone and redone. We monitor each other and ourselves.

This shift is not restricted to the economic sector, however. Even warfare, which has long been the domain of the State and implemented through strong hierarchies, is being radically reconfigured in network terms through initiatives that emphasize decentralization; spontaneous self-organization; information technologies; and recombinant alliances among militaries, governments, and nongovernmental organizations (Arquilla & Ronfeldt, 2001; Atkinson & Moffat, 2005; Edwards, 2000). Al-Qaeda is, of course, a networked organization. However, one good example of a spontaneously forming network is that of the passengers of Flight 93, who turned on their cellphones after being hijacked, only to find out what had happened to the

other planes on that terrible day. With this information, they swarmed the terrorists, defeating them—though at an awful price (see Reynolds, 2006, p. 69).

The shift from hierarchical to networked organization is theorized by Castells in *The Rise of the Network Society* (1996). He argues that the traditional form of work is eroding (p. 268). Employment now is characterized by decentralized data entry (p. 248), the concentration of higher-level operations in the hands of skilled workers (p. 248), multiskilling of jobs (p. 251), the individualization of responsibility (p. 251) and labor (p. 265), and segregation by education (p. 251). He concludes, "The new social and economic organization based on the information technologies aims at decentralizing management, individualizing work, and customizing markets, thereby segmenting work and fragmenting societies" (p. 265).

In such an environment, it is no wonder that people have begun to adapt techniques and technologies from office life to manage their home life as well (Allen, 2003; Covey, 1990; Geisler, 2003). Time management gurus Stephen R. Covey and David Allen separately declare that they see no practical difference between home and work life. Cheryl Geisler finds in her studies of personal digital assistants that although a difference does remain for some personal digital assistant (PDA) users, it appears to be eroding. At the same time, work has become more fragmented, leading to a wealth of research on how workers manage and organize the surfeit of information (e.g., Czerwinski, Horvitz, & Wilhite, 2004; González & Mark, 2004, 2005; Hutchings, Smith, Meyers, Czerwinski, & Robertson, 2004; Johnson-Eilola, 2005; Mark, González, & Harris, 2005) and leading in an explosion of time management and lifehacking resources. Similar trends can be seen in journalism (Boczkowski, 2005) and warfare (Arquilla & Ronfeldt, 2001).

Whatever we call this shift—distributed work, the control society, the informatics of domination, the support economy, the ownership society—the characteristics are the same: Control over organizations is just as distributed as ownership is in managerial capitalism; digital technologies play a vital role in forming, interconnecting, and even dispersing nodes; consumption is individuated, taking the form of the desire for unique identities and unique experiences; relationships between customers and businesses become more important, even as the distinctions between them become unclear; and customers look for stable beneficial relationships among consumers and producers that support these individual experiences (cf. Sless, 1994). These needs are supplied not by large, vertically integrated companies but by temporary federations of suppliers for each individual transaction. These federations are endlessly recombinant. Lifelong employment is replaced by what Zuboff and Maxmin call "lifelong learning" —what Donna Haraway calls continual deskilling and retraining, and Castells calls multiskilling—as workers cope with continually changing arrangements.

In this shift toward distributed work, negotiation becomes an essential skill. Trust becomes an ongoing project. Organizations become looser aggregations held

together by alliances, and agility entails constantly having to work to reaffirm and redefine alliances (Alberts & Hayes, 2003; Atkinson & Moffat, 2005). Thus, rhetoric becomes an essential area of expertise; direct connections mean that everyone can and should be a rhetor (Carter, 2005). That is, when we are all potentially in contact with each other, across organizational and disciplinary lines, we must persuade more people coming from different domains—not just our superiors and coworkers, but also service providers, contractors, customers, and amateur enthusiasts of relevant communities. Stakeholders multiply, as do the connections between them.

We can see the signs of a shift toward distributed work in the service sector, in the outsourcing of technical support, and in places like eBay and Craig's List. But we can also see it in the rise of homeschooling, the weakening of unions, the shift from stable identity politics to unstable political subsegments, the popularity of automobile customization, the increasing importance of content management systems, and the early success of Howard Dean's 2004 presidential campaign. We see it in social networking, from the early message boards studied by Zuboff (1988) to later iterations such as blogs, del.icio.us, Flickr, MySpace, and Peerflix. We certainly see it in the open source movement.

DISTRIBUTED WORK AND TECHNICAL COMMUNICATION, OR WHY IS THIS OUR PROBLEM?

What does distributed work mean to us as technical communicators? How is it changing our field, and how must we adapt in anticipation of these changes?

As I have argued, work is becoming more distributed: distributed across time, space, disciplines, fields, and trade; distributed across a multiplicity of stakeholders; distributed through telecommunications and digital technologies. Technical communication researchers have been investigating these separate aspects of distributed work for some time, although often not in connection with each other.

For instance, the spatial, temporal, and disciplinary distribution of work has been discussed in literature dealing with the increase in crossfunctional work (Smart & Barnum, 2000), studies of interactions among disciplines (Artemeva & Freedman, 2001; Spinuzzi, 2003), and the offshoring of technical communication. Its educational implications have been reflected in comparative studies of writing across the curriculum (Russell & Yañez, 2003), in changes in the writing curriculum (Amidon, 2005; Johnson-Eilola, 1998, 2005), in curricular software (Zachry, 2000b), and even in changes in the venue of writing (Faber, 2002, 2003).

The multiplicity of stakeholders faced in distributed work has been addressed through interests in new theoretical frameworks that take these diverse stakeholders into account (Freedman & Smart, 1997; Geisler et al., 2001; Russell, 1997;

Slack, Miller, & Doak, 1993; Winsor, 2001) and in research methodologies meant to account for them (Smart, 2002; Spinuzzi, 2003, 2005).

Finally, and most pervasively, the digital technologies that support distributed work have been examined in several areas, including personal, self-mediational work (Geisler, 2003); coordinated, collaborative work (Clark, 2002; Johnson-Eilola, 2005; Spinuzzi, 2003); community sites (Grabill, 2003; Harrison & Zappen, 2003; Spinuzzi, Bowie, Rogers, & Li, 2003); and the design of individually customized, mass-produced items (Sless, 1994).

Scholars in technical communication, then, have been examining a range of issues and phenomena related to distributed capitalism, although not usually with an explicit orientation toward it. The common thread has not been discussed much; technical communication as a field has not yet come to grips with distributed work or thought through its implications. We have not yet moved toward a relatively coherent discussion of what these economic, political, and sociocultural changes mean to us. With or without this discussion, though, technical communication is going to change—and has already begun changing. Practical discussion has turned to single sourcing and Extended Markup Language (XML), information sharing and community forums, project management and content management. Customers are not reading documentation, they are Googling for answers or swapping information on websites. And the interdisciplinary field of technical communication keeps expanding into different fields: Working technical communicators find themselves becoming "dividuals"—one part writer, one part project manager, one part programmer, one part student. We have to get a handle on what is currently happening to the field and where the trend lines point. That is what this special issue is about.

DISTRIBUTED WORK IN THIS SPECIAL ISSUE

The papers in this special issue explore different aspects of distributed work: how workers both distribute and coordinate activities through mobile technologies; how workers undistribute work to achieve relative coherence and stability in the face of work fragmentation; and how students learn to work in teams separated by spatial, temporal, and disciplinary boundaries.

In *Mobility and Composition: The Architecture of Coherence in Non-places*, Jason Swarts describes how PDAs "create conditions where one domain of activity overlaps with another." How, he asks, do these handheld technologies affect the ways that their users both distribute texts across space and time, and coordinate them with other sources of information? In this study of veterinary students, Swarts draws some fascinating conclusions about how these PDA users constructed coherence in these non-places by composing textual connections—and how design changes could improve their ability to make these connections.

Like Swarts, Shaun Slattery studies users of digital texts who find themselves inhabiting densely interpenetrated work activities. These symbolic-analytic workers, he finds, had to deal with organizational, textual, and technological distribution and fragmentation. By coding and visualizing this work, Slattery provides ways to systematically analyze this work. Writing, he concludes, allowed these workers to undistribute their work, drawing it together and restoring some measure of coherence.

The students who appear in Marie C. Paretti, Lisa D. McNair, and Lissa Holloway-Attaway's study were distributed in a different sense. In *Teaching Technical Communication in an Era of Distributed Work: A Case Study of Collaboration between U.S. and Swedish Students*, the authors describe students who found themselves collaborating across national, cultural, and disciplinary boundaries, using the digital technologies that Zuboff and Maxmin argue have made distributed work possible on a global scale, and to a degree replicating the sorts of collaborations in which they may find themselves engaging as they become knowledge workers in a global economy. The difficulties they encountered—and the boundaries they constructed—serve to temper the optimism and exuberance that new economy enthusiasts often express.

This note of caution is extended in the book reviews. In his review of four popular books about the new socioeconomic era, Mark Longaker identifies and sharply critiques the common narrative that underlies them. Natasha Artemeva examines *Between School and Work: New Perspectives on Transfer and Boundary-Crossing*, a collection that applies activity theory and related sociocultural approaches to distributed work, particularly the problem of overlapping work activities. Finally, Locke Carter brings us back to Zuboff and Maxmin's *The Support Economy*, the text that has provided the primary frame for this special issue, with a critical review that examines both gold and dross.

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