1

Networks, Genres, and Four Little Disruptions

It's mid-spring in 2001 and you've just moved to Midsize City, Texas. You order telephone service from a company we'll call Telecorp. You pick up a phone – not your own, of course, but one that you borrow from a friend or even one that is thoughtfully provided in the offices of the telecommunications company itself. You speak at some length with a Customer Service representative. Several days later the phone jacks in your new place are turned on. You plug in your phone line and begin dialing. What could be simpler?

Within Telecorp, however, your information has to undergo an extended series of transformations. In Customer Service, the information is written up in a file order confirmation (FOC), a form based on a word processor template. It is e-mailed to a supervisor, who forwards it to a data entry worker. That worker prints it out, highlights particular pieces of information, and enters data into the centralized database. The FOC also gets forwarded to other places: Credit & Collections, where workers make sure that you're creditworthy; CLEC Provisioning, where you're assigned a phone number from the database used by all telecommunications companies in the area, and your physical address is keyed into the 911 database; CLEC Design, where your personal circuit is designed and associated with the number you've been assigned. And just as the FOC is transformed in different ways to meet the needs of those different groups, the transformations themselves engender more transformations. Your new record in the centralized company database becomes hooked up with the billing system, ensuring that you get your bill on time; your new number is put in the switch, ensuring that you actually receive calls; a complete history of every interaction you have with the company is maintained in the central database by Customer Service, the Network Operations Center, Sales, and others with whom you may have contact throughout your relationship with the company. When

Accounts Payable	Data Network Products
Administration (including Accounts Receivable)	Human Resources
Alarm Management System	Information Services
Bill Verification	Internet Help Desk
CLEC Local Operations	Network Coordination
CLEC Network Administration	Network Design & Inventory
CLEC Provisioning	Network Operations
Computer Services	Network Operations Center
Credit & Collections	Sales
Customer Service	Wholesale Markets

FIGURE 1.1. Functional groups at Telecorp, 2001.

you place calls, those calls will go through a patchwork of lines, switches, and fiber owned by several different companies. If you make a call regularly (say, to your mother in Ohio), it will rarely follow the same pathway twice. Each company leases lines from the others and reconfigures its long distance routes each month on the basis of fluctuations in lease prices.

What's more, during your relationship with the company, the list of features available to you will continue to grow. Telecorp began by *reselling* long distance service – that is, it offered only long distance service, and even that service was actually provided by another company and simply rebranded as Telecorp's – but now it offered its own local and long distance service, calling cards, long distance pagers, DSL, Internet dial-up, mobile service, conference calling, and on and on. That increasing complexity is accompanied by an increasingly complex division of labor. From a handful of people in the 1980s, Telecorp grew to over 300 in 2001, grouped into about 20 heterogeneous functional groups (depending on how you count them). See Figure 1.1.

Few of these groups actually understand each other's work. When I began researching Telecorp, my research question was: How do genres circulate in a complex organization? By the end of the project, I inflected the question somewhat differently: How on earth does this company function when its right hand often doesn't know what its left hand is doing? How do such knowledge work organizations function and thrive, and how can we develop a better theoretical and empirical account of this sort of work? Like many

knowledge work organizations, Telecorp was surprisingly heterogeneous and multiply linked, and those characteristics are not especially conducive to the centralized control that we associate with traditional, hierarchical, modular work.

Here are four ways in which the right hand doesn't know what the left is doing – four minor, quotidian disruptions that occurred regularly in Telecorp's ongoing knowledge work.

Disruption 1: Anita Thinks Geraldine Is Slacking. At the Internet Help Desk, Anita receives a note from Geraldine in Sales to call a customer who has a technical problem. It turns out that the customer has no technical problems, he just wants to sign up for Telecorp's dial-up Internet service – something that, according to Anita, Sales should handle. After transferring the customer back to Sales, Anita angrily logs the incident; later she tells me that she hopes upper management will see a pattern of this sort of behavior in the logs. Although she is convinced that Sales should have taken responsibility for the customer in the first place, Anita confesses that she doesn't really understand what Sales does.

Disruption 2: Darrel Thinks Gil Is Being Unreasonable. Darrel, a sales representative who has only been on the job for a few weeks, is happy to take a rather large service order from a company. Darrel sends the order to Credit & Collections for approval. Soon, he receives a terse e-mail from Gil in Collections saying that this customer is not a good bet and that this kind of customer should be avoided – but no explanation of why the customer is rejected. Incensed that his customer is treated so shabbily and (more to the point) dismayed that his large commission is about to disappear, Darrel enlists the help of more experienced workers as he writes an e-mail urging the vice president of Sales to intervene.

Disruption 3: Abraham Threatens to Fire Workers. Telecorp's database of customer accounts includes time-stamped notes, called "F1 notes," that Customer Service workers enter to record changes to each account. (They're called up by pressing the F1 key.) In Telecorp's early days, F1 notes were rarely used and tended to be only a couple of words when they were. Since Telecorp was much smaller then – just a handful of people – knowledge likely circulated through conversations and paper files. But as the company grew larger and the division of labor grew more complex, documentation became more important and workers were asked to use the F1 notes more thoroughly. Several months before my study began, the crisis came to a head in Customer Service and Abraham, the manager, threatened to fire workers who did not use F1 notes as prescribed; later, he introduced a script for workers to use.

> **Disruption 4: Jeannie Talks Past Local Provisioners.** Long distance provisioners such as Jeannie periodically place orders with local (CLEC) provisioners. But they grow increasingly frustrated with each other because certain orders don't seem to be filled correctly. Eventually, they realize that they have been using the same terms to mean very different things. As Jeannie puts it: "Their prem to prem is just different from what we consider a prem to prem. So we were talking back and forth a long time about prem to prem, until we figured out, 'Oh, *your* prem to prem is not the same as *our* prem to prem.'"

These four little disruptions are by no means major or crippling, but they are surprising in their character and frequency. Telecorp is not an anomaly: it's not poorly managed or run. On the contrary, it's very successful and these disruptions result in part because of its rapid expansion. They are emblematic of the disruptions I saw over a 10-month period at Telecorp – and the sorts of disruptions that we are increasingly seeing in knowledge work. All involve people from different functional areas collaborating to solve problems, connecting in *networks* that include different tools, objectives, rules, and divisions of labor, tools, and artifacts. And all involve types of texts in one form or another, *genres* that are circulated, transformed, displaced, hybridized, and developed to meet the needs of particular, localized work.

In this chapter, I'll discuss these two commonalities, drawing on two major schools of thought based in two rather different understandings of activity that are currently competing to represent and explain knowledge work: activity theory and actor–network theory. These two approaches have strong similarities that make both strong candidates for theorizing knowledge work. But they also have sharp disagreements, and in airing those disagreements we can productively examine many of our assumptions about work organization and structure. The two commonalities of network and genre are a good place to start. So in this chapter, I'll discuss these two commonalities and how they structure the rest of this book, which is all about how genres circulate through and help build networks of activity in knowledge work and how we can trace those genres to better understand their networks. Then I'll discuss the Telecorp research study itself.

NETWORKS

Let's start with networks, the source of our first two disruptions. What is a network?

The term *network*[1] in the way I'm using it here – heavily influenced by actor–network theory and activity theory – is being abandoned right and left. In 1999, some of the guiding lights of actor–network theory wrote in the pages of *Actor–Network Theory and After* that actor–network theory was, well, over. Bruno Latour declares that the term *network* has "lost its cutting edge" and in the process has lost its meaning as "a series of *transformations* – translations, transductions – which could not be captured by any of the traditional terms of social theory" (1999a, p. 15). He agrees with Michael Lynch that "actor–network theory" should instead be called "actant–rhizome ontology" (p. 19), though to his credit he agrees that the new appellation is monstrous and nobody should actually use it.[2] Similarly, John Law argues that actor–network theory, by becoming an object of study, has lost its essential charm: "The act of naming suggests that its centre has been fixed, pinned down, rendered definite" (1999, p. 2). He declares that the purpose of the collection "is to escape the multinational monster, 'actor–network theory,' not because it is 'wrong' but because labeling doesn't help" (1999, p. 2). Like Latour, Law believes that the term *network* has worked against itself, providing the illusion that complexity can be managed and simplified, implying that "*an assemblage of relations would occupy a homogeneous, conformable and singularly tellable space*" (p. 8, his italics). In response, these scholars and others have attempted to add supplemental metaphors such as fluids, modes of coordination, regimes of delegation, rhizomes (see Latour, 1995), ecologies (Star, 1995; Star & Griesemer, 1989), gels (Sheller, 2004), and plasma (Latour, 2006). These get messy rather quickly, and although that's the point – to provide a nonfragmentary, amodern way to follow continually fluxing transformations, one that is not "a return either to essences or to structures" – it's still not much fun to wade through them.

For activity theorists, on the other hand, structure is a desirable aspect of a network. In an exchange in the pages of *Mind, Culture, and Activity*, Yrjö Engeström (1996b) complains that "Latour's actants [in actor–networks] seem to have no analyzable inner structure; they are like monads or amoebas. Instead of jumping directly from actants to networks, I suggest stopping to discover the intermediate institutional anatomy of each central

[1] Note that the term is used differently here than it is generally used in sociology (Polodny & Page, 1998), economics (Castells, 1996), or warfare studies (Arquilla & Ronfeldt, 2001b). I draw insight from some of this literature in later chapters, but my main focus is on examining networks as they are understood in actor–network theory and activity theory: as translations or transformations that tie together mediated activities.

[2] In *Reassembling the Social* (2006), Latour (characteristically) reverses himself and reclaims the term *actor–network–theory*, even adding a hyphen (p. 9).

actant – that is, the historically accumulated durability, the interactive dynamics, and the inner contradictions of local activity systems. And I recommend keeping one's eyes open for both vertical and horizontal relations in activity systems and their networks" (p. 263; see Engeström & Escalante, 1996, for an illustration). Latour (1996c) replies that Engeström has missed the point, as indeed he has: actor–network theory and its postvariants are *supposed* to have no inner structure, no scale or hierarchy. That doesn't stop Engeström and other activity theorists from cherry-picking elements of actor–network theory for their own use, envisioning *activity networks* in which relatively stable (though never static) cultural–historical activities become interlinked (e.g., Bazerman, 2003; Engeström, 1992; Korpela, Soriyan, & Olifokunbi, 2000; Russell & Yañez, 2003; Spasser, 2000).

Yet Engeström's own later work leads him away from stable structures and toward "work that requires active construction of constantly changing combinations of people and artifacts over lengthy trajectories of time and widely distributed in space" (Engeström, Engeström, & Vähääho, 1999, p. 345), work that has no center or stable configuration (p. 346). That description sounds suspiciously like Latour's description of networks, but the authors argue that "networks are typically understood as relatively stable structures" and thus do not provide a sufficient explanation (p. 346)! Engeström et al. (1999) invent the term *knotworking* to describe this phenomenon. Elsewhere, Nardi, Whittaker, and Schwarz similarly accuse actor–network theory of being too reliant on structures. They favorably contrast *intensional networks* (or *netWORKing*) with actor–network theory, saying of the latter that it assumes "firm footings in institutional structures inhabited by Machiavellian 'Princes'" as opposed to the "incessant buzz of small but crucial communications and reflections [that] shaped people's worklives and consciousness" in their study (2002, p. 235).

In this gloss, some of the many subtleties of Engeström et al.'s (1999) and Nardi et al.'s (2002) arguments get lost; I'll take these up more thoroughly later in the book. But what I want to emphasize here is that just as actor–network theorists have more or less jettisoned the term *network* because it had come to imply static structures, activity theorists are now beginning to question the term for the same reasons – and imputing its structural connotations to actor–network theory itself![3]

[3] But see Reijo Miettinen's (1999) incisive comparison of actor–network theory and activity theory. Miettinen, more than other activity theorists, understands actor–network theory and provides an even-handed critique.

I think much of this confusion has to do with slippage in the term *network*. In actor–network theory, actor–networks are *assemblages of humans and nonhumans*; any person, artifact, practice, or assemblage of these is considered a node in the network and indeed can be an actor–network in itself. Links are made across and among these nodes in fairly unpredictable ways. Since there is no hierarchy or "analyzable inner structure," the only restrictions to linking are relational or associational. Will this link advance the agenda by enlisting more allies, enrolling more actants to accomplish one's agenda? Will an alliance with this person, this text, this practice, be productive? One can see why actor–network theory is considered *political* and *rhetorical*: it is in effect a politics and a rhetoric of symmetry, one in which no Cartesian lines are drawn between humans and nonhumans (see Latour, 1999b). One can also see why actor–network theorists have turned of late to the notion of *rhizome*. As Deleuze and Guattari (1987) lay out the concept, "any point in the rhizome can be connected to anything other, and must be." And "a rhizome may be broken, shattered at a given spot, but it will start up again on one of its old lines, or on new lines" (p. 9). Rhizomes are made up of diverse, heterogeneous acts and materials that cannot and should not be categorized, placed in subject–object distinctions, or otherwise separated to generate strong explanations of their workings (cf. Callon 1986a, 1986b, 1991; Law, 1986a, 1986b, 2002a). Among those strong explanations is cognition, and in fact Latour and Woolgar (1979) famously called for a moratorium on cognitive explanations.

As Engeström's quote suggests, activity theorists don't buy this free-wheeling notion of network. Activity networks are *linked activity systems* – human beings laboring cyclically to transform the object of their labor, drawing on tools and practices to do so. These activities themselves are the nodes, nodes that are constituted by, but transcend, the humans and nonhumans who participate in them. The links in the nodes of an activity network are often portrayed as supply lines: Activity A labors to produce an artifact that then serves as a tool for Activity B; Activity C labors to develop practices that then serve as rules for Activity B; and so on. Activities do indeed *interpenetrate* or overlap (Russell, 1997a; Spinuzzi, 2003b), but they can still be pulled out and examined separately. And – most importantly – activity systems and the networks in which they operate *develop* and *change*. Activity theory incubated in the field of educational psychology; its central concern is not politics or rhetoric or alliances, but *cultural–historical development* of individuals and groups. Such a focus demands the foregrounding of human beings and their labor and requires ways to account for

change-in-stability that aren't demanded in the political–rhetorical orientation of actor–network theory. At the same time, due partially to criticisms from other perspectives, activity theorists are beginning to examine how activity networks have often been conceived too rigidly to explore impromptu collaborative performances, and in response they have begun to turn to "knotworking," "netWORKing," and similar concepts adapted for knowledge work. Activity theorists do not reject cognition per se, but they lean toward a distributed understanding of cognition in which people mediate their cognition with physical and psychological tools (Cole & Engeström, 1993).

So with scholars turning away from networks in different directions – to rhizomes, ecologies, gels, plasmas, knotworking, netWORKing, and so forth – why should we stick with the tired old notion of networks? Simply, I think that this disagreement over networks can be useful. And rather than throwing up my hands and abandoning the whole mess, I want to exploit the tensions among these different understandings of network, and I want to apply them to a third understanding of network: a physical telecommunications network made of wires, wood, plastic, and glass. Let's move from this academic discussion into some concrete examples.

Disruption 1: Anita Thinks Geraldine Is Slacking

On one floor of the Telecorp Center, Anita and her colleagues at the Internet Help Desk answer calls from customers using Telecorp's dial-up Internet access. Since Anita works the day shift, she mostly fields calls from retirees. Their questions tend to be along the same lines: I can't log into my account today; I tried to connect to the Internet but nothing happened; I'm not getting my e-mail. These problems and their fixes are so routine that much of the time Anita can walk the customers through the fixes while simultaneously surfing Web sites. Anita becomes frustrated when her customers don't follow her instructions or try to improvise: "Older people are the worst," she says truculently after one particularly difficult call.

Anita, like her colleagues, is young: she celebrated her 21st birthday during one of my observations. Some of the other Internet Help Desk workers are in their teens. Many are college students, and a couple are high school students. Like Anita, they have deeply internalized routine problems and fixes: as they walk customers through their problems, they simultaneously play multiplayer computer games, download MP3s, or check www.hotornot.com to discover whether other visitors to the site found their photos to be sexually attractive. They do this without any apparent loss in effectiveness.

Calls are answered by whoever is available, and individual customers do not call in regularly, so workers cannot develop – and certainly do not seek to develop – bonds with their customers. The Internet Help Desk workers inhabit a relatively insulated work world, one in which they rarely interact with other teams and interact in very limited terms with customers.

On another floor in the same building, Sales is a very different place. Sales representatives tend to be older, and some are a *lot* older, nearing retirement. They have difficulty absorbing the ever-increasing number of features and services that they can sell to customers, and most don't really understand the architecture that underlies such features; when new sales representatives learn about ATM/frame relay or Internet accounts, they do so by attending training sessions by technical employees rather than by learning from their fellow sales reps. Sales reps actively compete for sales, and in fact the Sales office has something that is not found anywhere else in Telecorp: a prominently displayed markerboard on which workers' performances are summarized, showing who has sold the most – and the least – that week. Their main focus is commercial telephone service because businesses order many lines, use them heavily, and tend to commit for long periods of time to their telecommunications providers. Residential customers are usually forwarded to Customer Service, unless a sales rep is having trouble making quota for that month. Commercial customers are wooed, assigned permanent sales reps who periodically check on them, discuss new service options, and find new opportunities to save them money. Whereas Internet Help Desk workers are paid by the hour, sales reps are paid commission, providing a powerful incentive to forge and maintain relationships with customers.

These two teams are composed of very different people with different motives, tools, training, expectations, and so forth. But sometimes these teams' separate worlds touch, and when they do, disruptions often occur. In one instance, Anita received a message from Sales via her IHD co-worker Damon: call this customer who is having trouble with his Internet account. She called the customer and found that he didn't have an Internet account with Telecorp after all. He wanted to register a domain name – something that, according to Anita, was Sales's job. So she transferred him to Sales.

These teams' worlds touch others as well. For instance, when residential customers call Sales to get phone service, they are passed to Customer Service: residential commissions are too small for sales reps to deal with and distract from the important work of building relationships with the more stable and profitable corporate accounts. Customer Service expects

this division of labor as a matter of course. It's hardly surprising, then, that Sales applies a similar model to its Internet dealings, off-loading new customers to the Internet Help Desk, which is seen as a sort of Customer Service for Internet services. And since we're on the subject of how groups perceive each other, let's talk about another important and multiply perceived group: management. Although this group is diverse, that diversity is rarely recognized in how managers are perceived by workers. Anita's acid notes on the above incident illustrate this point (typos are hers):

> GERALDINE CALLED DAMON TO OPEN UP SOME TICKET FOR CUSTS HWHO ARE NOT ABLE TO GET THROUGH TO THE HELP DESK. WHEN WE CALLED THE CUST BACK HE WAS NOT HAVING ANY PROBLESMS WITH HIS INTERNET, HE HAD QWUESTIONS ABOUT US HOSTING A DOMAIN FOR HIM.
>
> THIS HAS NOTHING TO DO WITH THE HELPDESK. THIS IS A ***SALES*** CALL.
>
> THE PERSON DAMON WAS TO CALL WAS NOT EVEN AVAILABLE. IMAGINE THAT . . .

As she was finishing up these notes on the trouble ticket, Damon called to her: "Hey, I have him on the line, and guess what. He wants to register a domain name!" Sales had transferred the customer right back to the Internet Help Desk! No wonder Anita's note is so acid and no wonder she chooses to surround the word "Sales" with so many asterisks. As she remarked after closing the ticket, this sort of incident happens a lot; she blames it on Sales pushing job responsibilities to others so they won't have so much to do. The majority of people who need our number have it, she says. According to Anita, when customers call Sales, they say: "I have a technical question," and Sales immediately routes the call to the Internet Help Desk – and the IHD workers have to open a trouble ticket for each one. That's why they write sarcastic notes, she explains – so that when "Corporate" reads through them, they'll see a pattern. The trouble ticket is not just an accounting of the problem or a way to cover one's bases; in Anita's hands, it becomes a rhetorical appeal to management, a way to enact change in the organization. By making this inscription – an account of the incident that she had to write anyway – Anita hijacked an existing sociotechnical network to protest how the division of labor was being enacted in the organization.

I saw no evidence that Anita's appeals were even read. It's not that management was uncaring, but who's going to read through the several dozen trouble tickets generated each day when there's so much other pressing work? As Latour argues (1986), power is best understood as a *consequence*