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Technological Grounding

Enrolling Technology as a Discursive Resource to Justify Cultural Change in Organizations

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In technologically grounded organizations, culture is bound tightly to the material characteristics of the technology that the organization manufactures, distributes, or services. Technological grounding helps explain why high-technology organizations often experience cultural integration problems following a merger. Examining the recent merger of US West and Qwest, this article analyzes how powerful actors strategically used the process of technological grounding to *enroll* a core technology to situate postmerger integration in technological terms, creating a discourse of inevitability that then justified publicly Qwest's cultural domination of US West.

Keywords: *mergers; social construction of technology; organizational communication; organizational culture; information technology; telecommunications industry*

On June 30, 2000, Colorado-based US West (a regional telephone company) and Qwest Communications International (an Internet start-up) completed a US$40 billion merger, the second largest business transaction ever in the state. This merger was one of a kind. Although local telecommunications companies had commonly merged with other local telecommunications companies, and Internet start-ups had merged with other Internet

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start-ups, the marriage of a local telephone company to an Internet start-up was rare. Industry analysts assailed the union, convinced that the radically different technologies offered by the two companies would produce a profound clash. One analyst commented, "Qwest and US West are about as far apart on the evolutionary scale in the world of telecom as you can get" (Kagan 1999). For employees, the change in technology brought changes to both work practices and organizational culture. Former US West employees who had worked only with voice data technology suddenly found themselves in a world dominated by Internet services. Conversely, employees of the former Qwest who had worked with an array of digital technologies felt stifled both by the seemingly "old school" technologies of US West and by the company's aging business focus. Shortly after its first anniversary, the new company (now simply named "Qwest") posted a US$3.3 billion loss, the largest quarterly loss ever recorded for any Colorado-based company. To reduce costs, Qwest eliminated nearly 12,800 employees by year-end 2001.[1]

Many studies document the difficulties of postmerger integration between companies that produce similar services and/or products for similar industries (Shrivastava 1986; Hitt, Hoskisson, and Ireland 1990; Chatterjee et al. 1992; Greenwood, Hinings, and Brown 1994; Larsson and Finkelstein 1999). For companies that provide distinct services in a diverse industry, integrating organizations postmerger proves a monumental challenge. In fact, most mergers that attempt to integrate organizations with different core products or services are unsuccessful (Ralls and Webb 1999; Gancel, Rodgers, and Raynaud 2002). Cultural clashes between organizations contribute to unsuccessful postmerger integration (Buono, Bowditch, and Lewis 1985; Cartwright and Cooper 1993; Weber and Camerer 2003). Furthermore, the threat of losing cultural identity and the fear of absorption into the new company can lead members to oppose a merger on ideological grounds (Howard and Geist 1995; Mottola et al. 1997).

Although cultural studies of postmerger integration continue to provide a useful lens for studying organizational change, researchers note that studies of merging organizations rarely pay attention to the important role core technologies play in the constitution of organizational culture (Eisenberg and Riley 2001; Jackson, Poole, and Kuhn 2002). A *core technology* is the primary technology produced, serviced, or sold by an organization. In this article, we suggest that organizations that produce core technologies do not simply experience culture or technology clashes in postmerger integration. They also experience problems with the convergence of all cultural elements including technology, business models, corporate values, history, and

vision. We propose the concept of *technological grounding* to understand how technology contributes to cultural integration problems in merging organizations. The concept of technological grounding suggests that an organization's core technologies are, along with the work and communication practices enacted daily by members, a constitutive feature of its culture. In this case study of the merger of US West and Qwest, two companies with fundamentally competing core technologies and radically different organizational cultures, we demonstrate that technological grounding caused postmerger cultural integration problems because the culture of each organization was closely intertwined with that organization's core technology. By threatening changes to the core technology, the merger instigated cultural upheaval. Finally, we explore how powerful actors were able strategically to use the process of technological grounding to enroll discursively a core technology to situate postmerger integration in technological terms, and thus justify Qwest's cultural domination of US West. Overall, the findings indicate that the symbolic and discursive properties of core technologies can be enrolled so that the cultural dominance of one organization over another appears natural and inevitable, regardless of the empirical validity of such claims. We conclude with implications of these findings for research and practice on postmerger cultural integration.

Culture and Technology in Merging Organizations: Technological Grounding

Few would argue with the assertion that many mergers fail because of incompatible corporate cultures. Studies have documented the cultural differences causing integration problems in the mergers of Connecticut General and Insurance Company of North America (Cartwright and Cooper 1993), Daimler-Benz and Chrysler (Vlasic and Stertz 2000), and AOL and Time Warner (Leonardi and Jackson 2004). According to Weber and Menipaz (2003, 56), cultural differences between merging organizations often produce misunderstandings, fuel emotional reactions, and escalate conflict within the newly merged organizations (56). Yet, powerful actors in organizational mergers my be reluctant to abandon a deal even in the face of difficulties caused by cultural incompatibility (Cartwright and Cooper 1993; Weber, Shenkar, and Raveh 1996). Thus, organizations continue to merge despite the problems posed by cultural differences.

If culture is a primary cause of postmerger integration problems, this metaphor for understanding organizations deserves more attention. Alvesson (2002) discusses two dominant perspectives for understanding culture that exist in organizational literature. The first perspective treats organizational culture as a variable. Studies from this perspective treat culture as something organizations have, which powerful actors are thus able to manipulate to achieve strategic ends (Pettigrew 1979; Schein 1992; Sorenson 2002). This conceptualization is attractive to those who study mergers and acquisitions because, as Walter (1985) notes, if cultures are something organizations have, they can be changed when necessary in the merger process.

Envisioning culture as a variable implies that technology, too, is a variable (Avison and Myers 1995)—concepts that then frame how we understand the relationship between technology and culture. Depending upon the alignment of cultural and technology within an organization, the relationship between these variables can either be seen as technology exogenous and culture endogenous (Pennings and Gresov 1986; Bierly and Spender 1995) or as technology endogenous and culture exogenous (Barley 1986; Orlikowski 1992; Fulk 1993). In either case, when the perspective of culture as a variable is employed to understand mergers, technology becomes a related, but independent, construct affecting cultural integration, for technology and culture are seen as distinct empirical phenomena. As a consequence, when cultures clash, technologies clash, too.

Alvesson suggests that a second perspective for understanding cultures in organizations is to treat culture from a constitutive perspective—a view that favors the notion that organizations do not have cultures but are instead cultures in their own right. From this perspective, culture is a process constituted by the enactment of work and communication practices (Martin 1992; Eisenberg and Riley 2001). Thus, culture does not exist apart from the actions that define an organization. Therefore, postmerger alignment means that members have to make deep, systematic changes to the entire organization for successful integration to occur—the very types of changes managers often seek to minimize to reduce culture "clashes" (Perry 1986; Schweiger and DeNisi 1991). From this perspective, instead of cultures simply clashing, organizations face cultural convergence challenges because the entire set of practices that constitute an organization may be at odds with one another.

When organizational culture is viewed from a constitutive perspective, technology is not a variable but is rather a practice that entwines itself with other work and communication practices to constitute a culture. In other words, culture is tightly bound to the material characteristics of the

technology that the organization manufactures, distributes, or services. Arguments for the interrelationship of the material and social elements have been made in social studies of science and technology, as in Fujimura's (1987) observation of the alignment of multiple elements in scientific work, or insights into actor-networks and the alignment of heterogeneous elements in technology design (Law 1991; Law and Hassard 1999). When the material and social are viewed as mutually constitutive, meaning becomes sedimented (Leonard-Barton 1988) or embedded (Star and Bowker 2002) in the artifact so that the present use or function becomes transparent and it is difficult to perceive an alternate function. That is to say, together with other organizational practices, technologies constitute organizational culture (Leonardi 2007).

When technologies are sufficiently important to an organization to become key elements in the constitution of a culture, we refer to that organization as *technologically grounded*. In other words, the organization is not simply a culture that uses a technology; instead, it is a culture whose image, identity, and relationship to its environment are strongly associated with—indeed, dependent upon—the functionality of the technology it produces, services, or sells. From a constitutive perspective, the concept of technological grounding suggests that technologies, imbued with symbolic values and constituted in material and social practices, permeate discursive constructions of the organization. More precisely, organizational cultures may be bound tightly to the material, social, and symbolic characteristics of their core technology as those characteristics are made manifest in the talk and action of organizational members. When this process occurs, we may say these cultures are technologically grounded.

All organizational cultures are, to some extent, technologically grounded, for technological grounding is not a category (either you are in or you are out) but rather a continuum. The more central a technology is to the functioning of an organization, the more technologically grounded the organization will be. Early organizational contingency theorists made a related claim, arguing that organizational design should consider how central a technology was to the organization's operation (Woodward, 1958; Thompson 1967; Perrow 1970)—the more central the technology, the more important it was for the organizational structure to be designed around its attributes. Thus, it was important to consider the role of an organization's "core technology" in design efforts. As Schein (1992, 36) suggests, the more essential a technology is to the organization's survival, the greater role it will play in the formation and perpetuation of that organization's culture: "An organization that is successful because of its mastery of a given

technology develops its self-image around that technology" (36). Some of the clearest examples of technological grounding appear in telecommunications and "high-technology" organizations. Tracing their lineage to AT&T (whose core technologies are often considered antiquated by modern standards). Telecommunications companies are best known for strong cultures that emphasize stability, standardization, and service even in the face of increasingly competitive environments (Deal and Kennedy 1982; Peters and Waterman 1982; Kanter 1983). High-technology companies that produce rapidly changing technologies, in contrast, are characterized by dynamic cultures of change and innovation (Kidder 1981; Kunda 1992; Downey 1998).

It is possible that technological grounding can create problems in organizational mergers or acquisitions if the organizations are grounded in different technologies, as technological incompatibility implies the incompatibility of organizational cultures and practices. Robey and Boudreau (1999) suggest that opposition to cultural integration will surface with the acceptance of a new technology into an organizational culture already familiar with distinctively different technologies. As they suggest, "Because the same artifact may simultaneously acquire different social meanings, even within the same culture, contradictory consequences resulting from information technology are easy to envision" (176). In the words of Widman, Jasko, and Pilotta (1988, 90), "no technology inherently 'makes-sense' within another cultural setting" (90). Thus, technological grounding implies that when two different organizations are characterized by cultures constituted, in large part, by the functionality of their respective core technologies, technical convergence after a merger will create problems with cultural integration.

The goal of this article is to employ the concept of technological grounding to examine how it is that, in the wake of the merger of two distinct technologically grounded organizations, one organization's culture comes to dominate the other. Researchers in the sociology of science and technology have long argued that because a technology's functionality is defined in relationship to the social context in which it is developed and used, no technology is inherently "superior" or "inferior" to another. Given this stance, we ask, "What are the strategies that powerful organizational actors utilize to merge the cultures of two technologically-grounded organizations?" To answer this question, we first present the case histories of US West and Qwest, two organizations whose cultures were grounded in very different technologies. We demonstrate the ways each organization's culture was grounded in its respective core technology and then discuss how

technological grounding produced problems for postmerger cultural integration. Finally, we explore how powerful organizational actors at Qwest were able to enroll attributes of their core technology in public discourse in a way that allowed Qwest's culture to consume that of US West.

Methods

This study used a single case design that allowed for the construction of a revelatory case—that is, a case that presents the opportunity for investigators to observe and analyze a phenomenon that is understudied or novel, as well as to answer "how" questions (Yin 1984). Because the constitutive relationship between an organization's core technology and culture has not been adequately examined in studies of postmerger integration, we used this procedure to use an embedded design. Embedded case designs use multiple levels of analysis to create rich and reliable accounts of organizational processes (Eisenhardt 1989). This study focuses on the merger of US West and Qwest from three levels of analysis (1) public discourse from company officials about the merger, (2) organizational practices and policies before and after the merger, and (3) worker responses during postmerger integration.

Data Sources

For effective triangulation of the important technological and cultural elements represented in the merger, we combined data collection methods such as archives, textual analysis, and interviews (Eisenhardt 1989). We used three data sources (1) published materials about the merger, (2) primary documents produced by US West and Qwest about their technologies and culture, and (3) interviews with public relations officials at the newly merged company to obtain the "official" story about the merger.

Published materials. Due to the unprecedented nature of the merger, news reports in both daily and trade press publications were abundant. Using two archival databases (Lexis-Nexis and FirstSearch), we collected articles or reports about the mergers that appeared in daily newspapers from June 1998 to June 2002, two years prior to and following the merger in June 2000. We included all major national US newspapers and major newspapers of the western region of the country. Articles contained either (1) public discourse about the company and the nature of the merger delivered by a public

official or industry analysts, or (2) reflections on the merger from workers at US West and Qwest, both premerger and postmerger. In total, we collected nearly 150 news articles about the companies.[2] Criteria for including an article in our database depended on the time period in which the article appeared. For the years preceding the merger, an article had to mention either of the companies and talk about the merger specifically or the possibility of a merger. Postmerger articles had to mention the organization's future or vision.

Primary documents. Industry reports and internal documents were examined as available. We collected additional primary material about the companies and the mergers (speeches, press releases, and official statements) from Qwest's website and from documents previously located on US West's website and cached on the Internet Archive (http://web.archive.org/web/*/http://www.uswest.com). In the primary documents collected, we paid close attention to descriptions of each company's core technologies. We also examined speeches, press releases, and website text for cultural indicators including themes, vocabulary, metaphors, and stories (Bantz 1993).

Interviews with public relations officials. Interviews were conducted with several public relations officials at Qwest following the merger. We chose to interview public relations officials because we were interested in the "official story" told about the merger. As Cheney and Christensen (2001) observe, paying attention to external communication about internal organizational processes reveals cultural ideologies about intended changes. Respondents were initially recruited through cold calls made to the organization and then through snowball method. The interview protocol consisted of 10 open-ended questions. Following methods for ethnographic interviewing (Spradley 1979), we asked supplemental questions based on the answers of respondents during the interview. Each interview began with a request for an overview of the "pillar messages" of the merger and for a description of why the two companies merged. Next, respondents were asked to trace the history of the merger beginning with the strengths and weaknesses of each company premerger through the strengths and weakness of the company at the time of postmerger integration. Finally, respondents were asked questions about the history, present use, and vision for the core technologies of the company, as well as to provide a description of the corporate culture.

Data Analysis

To describe effectively the isolated factors within a particular case, Yin (1981) recommends constructing a compelling narrative of events that is built on a clear conceptual framework. Because our framework suggests that an organization's core technology is a constitutive feature of its culture, we constructed case histories pertaining to each company's culture and technology before the merger, the culture and technology of the newly formed company during the transition period, and finally the pronounced direction of technological advancement and its relationship to organizational culture after integration.

The case histories were used for two kinds of analyses: within-case and cross-case.Within-case analysis focused on developing constructs that describe what happened in each case and why it occurred. An inductive approach allowed these insights to emerge from each case independently. To catalog these findings, we constructed a chronological outline of the relationship between core technology and culture at three crucial points in the merger: premerger, during transition, and postmerger integration (Dobers and Strannegård 2001). Our within-case analysis compared the technology/culture relationship across these three points to understand how changes to core technology and culture reciprocally influenced one another.

Next, we used a cross-case analysis to elucidate the important similarities and differences among the histories of US West and Qwest in regards to their cultures and their core technologies. We had no *a priori* hypotheses as to what cultural grounding looked like in each organization, and used comparisons between cases to develop tentative propositions. Relationships were refined with repeated use of replication logic (Yin 1984), revisiting data, and narratives in an attempt to find patterns.

Once we had an understanding of the nature of technological grounding within each organization, the effect of technological grounding on each organization's identity and image during the merger, and the outcome of the relationship between core technologies and cultures after the merger, we set out to uncover how it was that Qwest's culture dominated the culture of US West. To do this, we returned to our raw data and culled all the instances in which officials made public comments containing discussion of both organizations. We constructed categories containing reasons, justifications, and outcomes provided by pubic officials about what the "new organization" should look like (Frey et al 2000). We then used a taxonomic analysis to link these categories together to explain "how" actors situated the merger in technological rather than in cultural terms, inductively generating the

concept of "discursive enrollment" which we use as a heuristic in our analysis.

The Role of Core Technology in Cultural Domination

In this section, we illustrate the concept of technological grounding by first showing the relationship between the core technologies and the cultures of US West and Qwest. Next, we discuss how the technological grounding that took place within each organization surfaced problems for cultural integration during the merger. We then explore how technological grounding allowed Qwest to marshal claims for cultural dominance over US West during the period following the merger.

Premerger: Organizational Culture and the Production of Core Technologies

Built on a history of more than 120 years in the telephone industry, US West had a varied and complicated history. At the turn of the twentieth century, the American Telephone and Telegraph Company (AT&T) expanded its Bell System of telephone service to create a Western Territory with outposts in Denver, Colo, Portland, Ore, and Deadwood, SD. These stations became the major hubs for areas that would later become Mountain Bell, Pacific Northwest Bell, and Northwest Bell, respectively. For most of its existence, AT&T operated a legal monopoly on telephone service, focusing on the transfer of voice data in the United States. In 1974, the US government brought an antitrust suit against AT&T and, as a result, the company divested itself of the Bell operating companies in 1984. Eventually, the Baby Bells of the Western United States were joined together into a new company to become US West, providing voice data transfer throughout the territory of the US West. At the time of divestiture, US West served 25 million customers in all fourteen western states, with 73,000 employees and revenues of US$7.4 billion. During its next fifteen years, employees decreased to about 60,000, but revenues nearly doubled to more than US$13 billion.

This initial unification of the separate Baby Bells proved difficult, due to problems both with integrating incongruous technological systems and with a heavily layered, bureaucratic managerial hierarchy. For a century, the primary concern of virtually all telephone companies, including US West,

was the reliable transfer of information. US West's most workable answer was to build circuit switching of calls, a process that invariably requires each call to travel on its own copper wire and switch to a new one when it needs to go in a different direction.

The advantage of this system is that most people have copper wiring in their homes and will for some time to come. The problem, that technicians have been trying to overcome for several decades, however, is how to build reliable switches that facilitate an accurate transfer of information from one wire to the next because analog data do not make the transition smoothly. Technicians at US West, primarily in the company's Advanced Technologies (AT) Labs, explored many different technological solutions to this problem. Thanks to this in-house R&D unit, US West became a leader in high-speed Internet and digital subscriber line (DSL) over existing phone lines. Although innovation became a central characteristic of the company, the technology developed was always related to phone lines and copper wiring. Although caring deeply about innovative technology, US West was first and foremost a local telephone company, always privileging service over the technology through which it occurred.

Operated within a well-defined territory, US West based its culture on a place it could call its own. The company's slogan, "Life's Better Here," expressed this point, conveying a pride in the entire western area of the United States. As US West CEO Sol Trujillo noted, "We are not on the page that says size counts . . . we're a proud regional company" (Rosenbush 1998). US West executives felt that others in the United States should be envious of the West as a location to live and work (and, presumably, use the telephone). As each previous Baby Bell acculturated with the next, communication of culture became key to building common connections. Common themes recur throughout a 55,000-plus-photograph collection compiled by the US West Telecommunications History Group about the history of both the company and the industry. Cowboy themes characteristic of the western territory were pervasive in US West's early advertisements, which depicted horse-riding cowboys and lone horsemen under the open sky, coupled with slogans such as "If you don't make dust, you can't eat dust" and "It is impossible to think small in a place this big" (Backover 2000d). Thus, keys to this culture were protecting or expanding territory and providing for voice data transfer.

The history of Qwest could not be more different. In 1988, oil and railroad baron Philip Asnchutz purchased Southern Pacific Railroad and created a subsidiary called SP Telecom with the hope of one day laying fiber-optic cables along the railroad's right of way. The railroad land

enabled the new company to construct networks more cheaply than its competitors. With a certain mixture of luck and foresight, fiber optics and open conduits were laid simultaneously with long-distance phone cables, ensuring bandwidth for future technologies.

By the end of 1995, the company had changed its name to Qwest and moved its headquarters to Denver. Business was slow but promising until the company completed a round of key hires in 1997. One of these new hires was CEO Joe Nacchio, formerly a vice president at AT&T. That same year, Qwest made its initial public offering (IPO), which allowed its stock to be traded publicly, began to construct a long-distance network in Europe, and officially branded itself an Internet data company with voice service capability. As Nacchio noted when he took over the company, "I want to create a full service communications provider" (Schiesel 1999). With emerging market for fiber optics turning into a competitive race to lay cable, Qwest, along with larger companies such as Juniper Networks and Sycamore Systems, scrambled to build as many backbones as possible while taking advantage of a virtually unregulated sector of the industry. Ambition and competitiveness paid off; by 2001, Qwest had become the fourth largest long-distance carrier in the United States, with over US$4 billion a year in revenue.

Qwest, though, had no history of which to brag. Formed as an ancillary but autonomous unit of a railroad empire, the company had never been linked to a specific geographic domain. Indeed, with its efforts to build a fiber optic–based communications network linking more than 100 cities in the United States, Qwest was placeless. Instead of territory, Qwest built its culture on speed—the speed at which the technology could connect the nation. The laying of optical fiber on railroad track right of way allowed the shortest and fastest routes between major optical hubs. Rather than provide a specialized service (like US West's voice data transfer), Qwest aimed to transfer digitally as many different data types as possible through fiber-optic networks constructed of strands of optically pure glass as thin as a human hair. Essentially, analog signals are translated into digital ones, which then travel in packets of light through a fiber-optic cable. Modern fiber systems with a single laser can transmit billions of bits per second, while systems using multiple lasers with different colors can fit multiple signals into the same fiber. Every 40 to 60 miles on a long-haul line, an equipment hut containing optical receivers (computer routers) picks up, retransmits, and regenerates each signal, encoded in a photocell, down the next segment of cable.[3] The benefit of using digital rather than analog signals is 2-fold. First, reliability and speed increase dramatically. Second,

content other than voice transactions can be transmitted through the same cable, allowing Qwest to provide an all Internet protocol (IP) network.

Accordingly, Qwest offered a wide array of products and services including local telephone service, long-distance phone service, high-speed Internet access, and video programming. Despite its wide product line, however, Qwest's specialty was data transfer and even after the merger, although Qwest took many risks in the implementation of new and expensive technologies, the company was not itself an innovator. Qwest buys its technology from third party vendors and does so to ensure speed. As Nacchio noted, "We're going to follow the technology and ultimately follow it wherever it goes, even into the consumer space" (Kokmen 1999). The diversity of products and markets offered by Qwest takes the focus off of both territorial expertise and technological form, instead directing the company to the functions of speed and service, two qualities generalizable enough to fit any product in any territory. Not surprisingly, Qwest based its culture upon such values and quickly became an organization of speed, as echoed in its slogan, "Ride the Light."

In Transition: Technology as a Cultural Indicator

One of the central technological differences dividing US West and Qwest was the method of information transmission. For US West, this process occurred through circuit switching of calls, a technology that worked well to transmit voice data over long distances. Owing to the immense area its phone lines had to cover, US West developed a technology with potential for regional expansion. As the company continued to focus on product development and growth, though, it lost track of its service element. Problems with service in such a large territory eventually earned US West the nickname "US Worst." As one former customer noted, "I call it 'US Worst;' it's easier to get service from US West in Moscow than in Montrose" (Cantwell 1998a). Unable to dodge its reputation, US West had to become more cautious and conservative. This negative reputation coupled with an aging technology made it even more cautious about implementing new technologies for fear that unproven ideas would lead to more service problems and ultimately to a worse reputation. For Qwest, in contrast to US West, information transmission meant service and speed. Defining itself primarily as an Internet company, Qwest seemed to believe that effective operation meant moving as quickly as the waves of light on which its information was transmitted. As one company spokesperson commented,

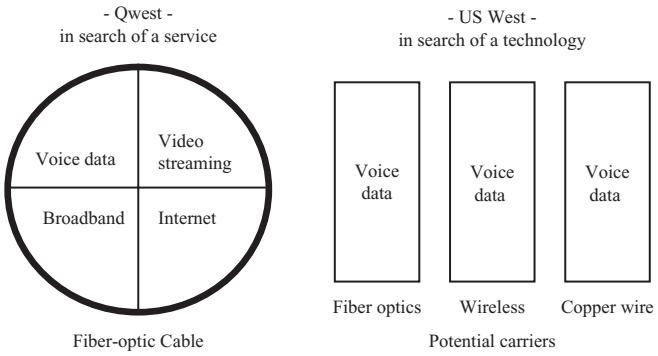
"Qwest is a company built for speed ... [we've] traditionally acted like an Internet company. We have an entrepreneurial mindset" (Berta 2001). As a consequence, any breakdown in the system would not only make the technology inoperable, it would also metaphorically injure the company's image and culture of speed. Thus, service also became a key element of its existence. Although the initial cost of implementing such technology was enormous, its promise ultimately to be cheaper, faster, and more efficient drove Qwest's culture to become so as well.

Our argument is that at the crux of the technological conflict between the two companies was the way in which technology was envisioned. Long concerned with the conquest of territory, US West sold a specific product to a specific area, building long-lasting relationships with customers. Voice data transfer remained the bread and butter of the company; circuit switching technology was merely one way to accomplish this. To US West, optical technology simply provided one means, among several others, of voice data transfer. Qwest, in contrast, conceptualized itself as pure speed. Qwest never had a product as much as it had an idea. As one industry analyst noted,

> A company like Qwest only innovates. It doesn't have any legacy systems, culture, customers, or relationships to nurture along and protect. It has a different focus. It has to punch its way on the map in a big, bold, innovative, rule-breaking way. That might scare conservative US West customers and shareholders to death. (Kagan 1999)

In essence, the company was itself a quest; it lived in and banked on a future dependent upon fiber optics, and it needed to have its costly fiber-optic investment filled with as many data types as possible. Qwest's fiber-optic cables could facilitate the transfer of many different data types, of which US West's voice data was only one. In contrast, US West was a voice carrier with no inherent bias toward any specific technology: different technologies merely represented different ways to transmit voice service. As a vice president at US West noted, "Many more customers are finding they need a line dedicated to a modem or fax, and then they add a third just for data. What used to work doesn't work anymore—to compete and keep up with their customers' expectations, they have to have those multiple ways of communicating" (Cantwell 1998b). Qwest, however, was a data carrier, providing the technology through which service providers of any type could transmit their information. For this reason, Qwest could never be completely committed to voice data transfer. Its world was envisioned in terms of what its technology could transmit (see Figure 1).

Figure 1
Visions of Technology



In portraying and making sense of the merger, each company privileged its own center and subordinated the other company. For example, as one Qwest spokesperson noted,

> The US West people who want to adapt, work in an entrepreneurial fast-moving organization and delight their customers, not insulate themselves and be wrapped in layers on layers of middle-management bureaucracy, will have long and prosperous careers at Qwest .... If they are not wise enough to either adapt or self-select out, they will be asked to leave. That doesn't matter if you are a senior vice president at US West or if you are a linemen tech installer. (Backover 2000c)

Given that US West was a long-established company with a strong sense of its history, and significantly more employees, and that it created nearly all the revenue for the new company, one might expect that its culture would have consumed that of the younger, more fluid Qwest. Yet, this story ends with Qwest's complete takeover of US West. US West ceased to exist, and its values were ridiculed openly by Qwest leadership. The US West website was replaced by Qwest's, which makes no mention of US West or its history. Throughout official company documents (including the website), the idea of territoriality gave way to the values of speed and service. Although the technology and the customers brought to the relationship by US West continue to earn revenue for the company, US West's traditional and bureaucratic culture was overrun by the free-form Internet culture of Qwest.

Postmerger: Technological Superiority as a Proxy for Cultural Dominance

Even though technological superiority seemed to be the key conflict in the US West/Qwest merger, it was merely one side of a deeper conflict that included struggle for cultural superiority in postmerger integration. Soon after the deal closed, Qwest chief Joe Nacchio noted that the difficulty in aligning the two companies would arise from the clash between "the new economy," represented by the former Qwest, and "the old economy," represented by US West (Beauprez 2000). The discourse ties each organization's cultural identity and values to the technology it produced. Qwest, tied to faster and newer technology, used the discourse to leave US West behind. As Nacchio understood, criticism of one organization's core technology was an attack not merely on the practices of the organization, *but also on its cultural values*. In a statement soon after the merger, Nacchio noted, "We are changing from a culture of entitlement to a culture of growth and service" (Gilbertson 2000).

Realizing quickly the shift in the company's direction, many US West employees accused Qwest of being too concerned with efficiency and profit. One former employee commented, "Qwest doesn't care about long-term employees and loyalty. All they care about is how many dollars they can show on the bottom line" (Smith and Caulk 2001a). Qwest executives did not deny these claims. They embraced them as representing core organizational changes—changes justified with the discourse of new technologies. Nacchio recognized these were core changes: "Our business model cherishes speed and engagement, their business model is more traditional" (Beauprez 2000).

In short, this business model dismantled US West. Soon after the merger, Qwest shut down US West's research and development center, AT Labs. Qwest saw internal research and development as inconsistent with a business plan rooted in the high-speed ISP market: it was costly, largely ineffective, and duplicated easily in other areas of the organization or simply outsourced to more capable firms. Corroborating Qwest's decision, one industry analyst noted,

> There's no reason for any service carrier to be in the business of either developing or manufacturing equipment. There is no reason why, if you have good supplier partnerships and major investments in cutting-edge broadband companies like Qwest does, to maintain an advanced technologies staff. (Backover 2000a)

Qwest's criticisms tore at the core of US West's ethos by criticizing its reputation for poor service, which Qwest claimed was earned by its aging technology and slow-moving bureaucracy. Nacchio noted, "Our assessment was that US West was not confident in their strategy. They demonstrated weakness in their own business plan because they had poor service" (Smith and Caulk 2001b). Yet, as pundits have observed, Qwest did not have legacy systems,[4] cultures, customers, or relationships to nurture and protect. Qwest's plan for growth took advantage of areas US West had "ignorantly" overlooked: high-speed Internet access, wireless service, video services, website hosting, and consulting services.

The dynamics playing out in the public arena provide insight into implications for organizational life in the new company. Born into a world of ephemeral Internet start-ups, Qwest had always been concerned with the bottom line. Cost reduction was achieved in many different ways. Employees often worked fifteen-hour days and performed many jobs. In contrast, US West prided itself on providing stable employment to loyal workers. US West employees felt they had security and a relationship with their employer. As one long-time US West employee, who was laid off after the merger, said of the former company, "Losing a job is like a divorce or death of your best friend .... I was contributing value to the company, and I was also having the time of my life .... It was always secure" (Hudson 2001). The transition to Qwest sharply changed the locus of identification. Immediately following the merger, Qwest experienced a mass exodus of US West employees who could not conform to this bottom-line mentality. For these employees, newer did not necessarily mean better. They directly rejected the speed that Qwest hailed as its crowning jewel. US West technology, while it might be outdated, was stable and helped provide stable jobs for employees and stable relationships with customers.

Technological Grounding and the Discourse of Inevitability

The case of US West and Qwest we have presented so far suggests that organizational culture and the production of core technologies are interdependent. In mergers, technological incompatibility implies problems with cultural integration or incompatibility of organizational cultures and practices. As Robey and Boudreau (1999, 176) argue, organizational oppositions can reside within a core technology itself: "Because the same artifact may

simultaneously acquire different social meanings, even within the same culture, contradictory consequences resulting from information technology are easy to envision" (176). Oppositions can surface within an organization because the technology is interpreted by some to be at odds with the values of one or more subcultures. Different factions may then use the technology instrumentally in their own political efforts. Technological grounding means that organizations build a culture upon the functionality of the technology, so that technical convergence creates problems for cultural integration.

In the merger of US West and Qwest, Qwest officials gained cultural control during postmerger integration by returning to the technology itself to frame the future of the organization. Enrolling technology in this way constitutes a powerful strategy derived from the standard logic in technical arenas that superior technology, as measured by technical criteria, supplants inferior technology. The corollary is that the technical superiority of one company's product over the other translates to its organizational superiority. Dominance thus established, the organization grounded in a supposedly superior technology may "absorb" the culture of the other in situations where cultural integration would be otherwise equal.

Technological grounding allowed Qwest to situate discursively the merger in technological rather than organizational terms. Qwest was a much smaller, much younger company with a still developing organizational culture. The culture of US West, in contrast, had become entrenched over decades and was embedded in the belief systems and practices of thousands of employees. Qwest relied on the characteristics of its technology to suggest that its domination over US West was inevitable—in the same way that fiber's domination over voice network was inevitable, despite its relatively smaller size and briefer history.

Such a discourse of inevitability rests on a doctrine of technological determinism. As Michael L. Smith (1994, 38) remarks, "'Technological determinism' is a curious phrase. The gist of it is heartbreaking in its simplicity: the belief that social progress is driven by technological innovation, which in turn follows an 'inevitable' course" (38). Technological inevitability directs social outcomes. In this case, the inevitable outcome was the acquisition of an old-school "telco" by a brash "Internet company." Positioning the merger in technological terms allowed Qwest to overrun US West's fundamental cultural values. Because the technology US West brought to the relationship was just one small and outdated piece of the wider technological network Qwest was establishing, the role to be played by US West technology was of only minor importance. Within this logic, Qwest's *cultural* domination—in additional to its technical domination—over US West was justified.

In this case, the assimilation of the technology into a larger technological network was felt on a number of levels. On a basic level, the hallmarks of territoriality and loyalty were central to the cultural identity of the employees of US West. Positioning the merger in technological terms allowed Qwest to overrun such cultural values. As Nacchio indicated,

> What I have to think about is how to put together US West and Qwest and not just serve the 14 states ... A year from now we'll look at US West as a seminal event in our history. We'll be working on more foreign deals, building in cities outside of US West territory. We're going to be truly a nationwide company, and we're certainly going to be more of a global company. (Cantwell 1999)

On a broader level, Qwest officials invoked technological inevitability to form a discourse of inevitability in which Qwest was destined or determined to dominate not only the technology of US West but its culture and organizational practices as well. Proclaiming his vision for Qwest, Nacchio is quite clear on how he thinks "integration" should happen: "We're going to become a broadband Internet communications and applications company. We're going to do it on a global basis. We're going to bring the power of the Internet and that technology to as many people as we can" (Cantwell 1999). Lacking from Nacchio's directive for the company, however, are the pieces US West brings to the relationship. Nacchio's statement is representative of a broader discourse that neither extols leadership in the local telephone industry nor values the vast network of voice data carriers that US West had created throughout the Western United States. It is a discourse that trivializes the culture US West built upon its core technology, and it makes the primary value of the company, the knowledge-capital of 65,000 employees, virtually obsolete in the presence of the supposed technological superiority of Qwest employees.

By intertwining discursively technology with culture, Qwest created narratives that could be used as *strategic resources* (Dunford and Jones 2000; Hardy, Palmer, and Phillips 2000; Tienari, Vaara, and Björkman 2003) in their takeover of US West. Embedding into the culture values associated with popular Internet technology through a narrative of inevitability provided Qwest a powerful normative frame. As Hirsch (1986, 828-9) explains, such frames are critical in successful takeovers: "Positions in the conflicts are thus justified by reference to established and favored values at the more generalized level of common culture .... The cultural embeddedness of the language permitted quicker adaptation and processing of the innovation, since it made the takeover accessible to a broader constituency" (828-9).

Discussion and Conclusion

Organizational culture is a way of talking about a sophisticated set of repetitive practices (Smircich 1983; Eisenberg and Riley 2001; Alvesson 2002). Constituted through work and communication practices, organizational culture writ large is a social construction continually undergoing reconstruction. Technology is one factor that enters into this process of culture construction. The attributes of a technology or the work processes associated with it translate into a set of practices that become part of cultural life. This is especially true for high-tech companies, who both use and produce information technologies. Furthermore, as technical and social practices grow up together in the organizational environment, technology and culture are mutually constitutive. Because technology is dynamic, subject to multiple and conflicting interpretations simultaneously held by organizational members (Fulk 1993), the practices of technologies in organizations become organizational and cultural practices. Thus, we return to an enduring theme in the theory of organizational design: from the constant reciprocal influence of social and technical practices emerge elements of organizational culture.

One contribution of this study is a framework for representing and analyzing this relationship between technology and culture or technological grounding. Technological and work practices become intertwined as organizational culture creates the conditions for the operation and application of the technology, and the technology simultaneously sustains and changes culture. Technology, then, cannot be abstracted or extracted from the culture that helps create its function and need, and in a similar manner, an organization comes to depend and rely upon the functionality of its core technology. As Deetz (1990) argues, once technologies contain the embedded values of the culture of which they are a part, they in turn condition the values of that culture, making fundamental cultural change or a sustained critique of organizational political dynamics unthinkable.

In demonstrating that technologies can be enrolled discursively in post-merger integration, we provide an answer to the question of how one culture may come to dominate another (Buono, Bowditch, and Lewis 1985; Gancel, Rodgers, and Raynaud 2002; Weber and Camerer 2003). Our analysis of the case of US West and Qwest reveals that control and domination are possible through a discourse of technological inevitability, which hides agents of power behind the "objectivity" of material artifacts (Leonardi, 2008). Invoking this discourse, Qwest repeatedly anticipated that the merger of the two organizations would end with the practices of its own "dominant" technology

eventually overriding the practices of the "lesser" US West technology. US West, whose culture was equally grounded in its core technology, could not escape the rationale of inevitability, even though that discourse had little objective base in reality. Because each culture embodied the epistemology of its core technology, technological superiority meant cultural dominance.

Our study also contributes to the emerging body of research that seeks to understand how specific actors make use of discursive resources to further their strategic goals (Tienari, Vaara, and Björkman 2003, 377-8). We show how organizational officials use media and other public texts to construct a position that closes off other discursive possibilities (Deetz 1990). The discourse of technological inevitability provides little ground for opposing discourses to gain purchase. Thus, top managers are able to justify and gain acceptance for the merger. Our analysis also reveals a particular instance of the discursive strategy of "winners" and "losers" (Vaara 2000; Hellgren et al. 2002), when discourse of technological inevitability allowed Qwest to control the playing field—winners and losers were predetermined by technology itself. Thus, this discursive strategy reframed the situation so it was not a contest. Instead, it became simply a statement of the way things must be.

Despite the discourse used by Qwest officials, the problems faced by merging high-technology organizations are not in actuality predetermined. Rather, they are constructed through and by organizational discourse and practice. The particular discursive practices made possible by technological grounding should direct organizational scholars to a closer examination of technical elements of core technologies to understand the ways in which these elements legitimate and justify certain organizational decisions by making them seem not only rational but in fact *inevitable* (Leonardi, 2008). In merging technologically grounded organizations, the underlying premise is that my technology will consume yours, and because our culture is inextricable from our technology, my practices (no matter how radical or drastic) are justified because they are dictated by the relationships between our respective technologies. As a result, the culture of the *superior* technology subsumes the culture of the *inferior* technology.

Our analysis suggests that researchers should consider foregrounding notions about technology that currently have little play in organization studies—notably technical convergence or obsolescence—as a way of identifying a process of cultural domination in postmerger integration. Such a focus can extend our theoretical understanding of the relationship between what Oswick, Keenoy, and Grant (2003) term the material world (the "practical order") and discourse. This study provides a concrete example of how

the material world can be enrolled by discursive subjects to negotiate or contest discursive concepts such as organizational culture. Qwest appealed to technical obsolescence, technological convergence, and the tie to the digital age that values the new and the computer-based over the old and the analog. The technologies provide a discourse of inevitability that is then enlisted by the organizations in their cultural struggle. Attention to technical elements of core technologies can inform our analysis, ultimately improving our understanding of cultural domination in postmerger integration.

Notes

1. For a compete background on the merger of US West and Qwest, including a detailed timeline of events, see (Backover 2000b).

2. Articles were collected from the following 15 newspapers: Chicago Sun-Times, Financial Times, Los Angeles Times, New York Times, Omaha World Herald, Rocky Mountain News, San Francisco Chronicle, Star Tribune, The Arizona Republic, The Denver Post, The Guardian, USA Today, Wall Street Journal, Washington Post, and Wyoming Tribune-Eagle. For a complete bibliography of news coverage and website material used in the generation of our case examples, please feel free to contact the authors.

3. For a detailed description of how optical fiber networks work, see Newton (1998).

4. *Legacy systems* are older, often proprietary, noninteroperable computing and networking technologies. Such systems represent large capital and operating investment and are difficult to modify.

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