

Technological grounding enrolling technology



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Technological grounding helps explain why history's organizations often experience cultural integration problems following a merger. Examining the recent merger of US West and Quest, 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 Quest'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 Quest Communications International (an Internet start-up) completed a \$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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394 Science, Technology, & Human Values 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.

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One analyst commented, “ Quest and US West are about as far apart on the evolutionary scale in the world of telecoms as you can get” (Kananga 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 Quest 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 “ Quest”) posted a US\$3.3 billion loss, the largest quarterly loss ever recorded for any Colorado-based company. To reduce costs, Quest eliminated of postmaster integration between companies that produce similar services and/or products for similar industries (Shirtwaists 1986; Hit, Hosking’s, and Ireland 1990; Chatter et al. 1992; Greenwood, Hinging, and Brown 1994; Larsson and Finniest 1999). For companies that provide distinct services in a diverse industry, integrating organizations postmaster proves a monumental challenge.

In fact, most mergers that attempt to integrate organizations with different core products or services are unsuccessful (Rails and Webb 1999; Cancel, Rodgers, and Armband 2002). Cultural clashes between organizations contribute to unsuccessful postmaster integration (Boon, Bewitch, and Lewis 1985; Cartridge and Cooper 1993; Weber and Camera 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 Ageist 1995; Motorola et al. 1997).

Although cultural studies of postmaster 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 (Ginsberg 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 postmaster integration.

They also experience problems with the convergence of all cultural elements including technology, business models, corporate values, history, and Leonard', Jackson / Technological Grounding 395 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 Quest, two companies with fundamentally competing core technologies and radically different organizational cultures, we demonstrate that technological grounding caused postmaster cultural integration problems because the culture of ACH 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 postmaster integration in technological terms, and thus justify Quest'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 and practice on postmaster 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 (Cartridge and Cooper 1993), Daimler-Benz and Chrysler (Villas and Street 2000), and AOL and Time Warner (Leonard' and Jackson 2004).

According to Weber and Maniple (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 may be reluctant to abandon a deal even in the face of difficulties caused by cultural incompatibility (Cartridge and Cooper 1993; Weber, Sheehan, and Raved 1996).

Thus, organizations continue to merge despite the problems posed by cultural differences. 396 Science, Technology, & Human Values If culture is a primary cause of postmaster integration problems, this metaphor for understanding organizations deserves more attention. Alveolus (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 (Pettier 1979; Scheme 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 (Poison 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 (Openings and Groves 1986; Briefly and Spender 1995) or as technology endogenous and culture exogenous (Barley 1986; Rollicks 1992; Full 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. Alveolus 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 process constituted by the enactment of work and communication practices (Martin that define an organization. Therefore, postmaster 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; Cheerier and Denies 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 397 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 Fissure'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 Hussars 1999). When the material

and social are viewed as mutually constitutive, meaning becomes sediment (Leonard-Barton 1988) or embedded (Star and Booker 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 (Leonard' 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 organization's operation (Woodward, 1958; Thompson 1967; Proper 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 Scheme (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 398 Science, Technology, & Human Values 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; Canter 1983). High-technology companies that produce rapidly changing technologies, in contrast, are characterized by dynamic cultures of change and innovation (Kidder 1981; Sundae 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. Robbery and

Bothered (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 Weidman, Jacks, and Pilot (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 nationality 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 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 Quest, two organizations whose each organization’s culture was grounded in its respective core technology and then discuss how

399 technological grounding produced problems for postmaster cultural integration.

Finally, we explore how powerful organizational actors at Quest were able to enroll attributes of their core technology in public discourse in a way that allowed Quest's ultra 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 postmaster 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 (Eisenhower 1989). This study focuses on the merger of US West and Quest 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 postmaster 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 (Eisenhower 1989). We used three data sources (1) published materials about the merger, (2) primary documents produced by US West and Quest 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-Nexus and Firefighters), 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 Quest, both premiere and postmaster. 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.

Postmaster 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 Quest’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. Sweet. Com](http://www.Sweet.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 (Bantu 1993). Interviews with public relations officials. Interviews were conducted with several public relations officials at Quest 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 and to the organization and then through snowball method. The interview protocol consisted of 10 open-ended questions. Following methods for ethnographic interviewing (Sprawled 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 premiere through the strengths and weakness of the company at the time of postmaster 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. 401 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: reemerge, during transition, and postmerger integration (Dopers and Stranded 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 Quest 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 Quest'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 public 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 402 Science, Technology, & Human Values 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 organization surfaced problems for cultural integration during the merger. We then explore how technological grounding allowed Quest to marshal claims for cultural dominance over US West during the period following the merger. Premiere: 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, Colorado, Portland, Oregon, and Deadwood, South Dakota. 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\$7.5 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 reared, 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.