

The School System as a Post-Fordist Organization: Fragmented Centralization and the Emergence of IT Specialists

TORIN MONAHAN
(Arizona State University)

ABSTRACT

This article explores organizational restructuring in one large public institution as a situated response to the instabilities brought on by globalization. Drawing upon ethnographic research with the Los Angeles public school system, I argue that a process of *fragmented centralization* is taking place, whereby decision-making authority is becoming more centralized while accountability for centrally made decisions is becoming more distributed. This process is propelled, in part, by the rise of a new occupational group of information technology (IT) specialists that is integrating itself into places of power and altering all aspects of organizational operations, transforming the school system into a post-Fordist organization.

KEY WORDS: globalization, post-Fordism, public education, Los Angeles, flexibility, information technology, decentralization, restructuring.

[F]lexibility has little or nothing to do with decentralizing either political or economic power and everything to do with maintaining highly centralized control through decentralizing tactics. (David Harvey 1991:73)

Introduction

In a global era of organizational interdependence and increasing public suspicion of government bureaucracies, the restructuring of public institutions in the USA is about shifting territory and reestablishing control, or at least the appearance of control, over inefficiencies. In Los Angeles Unified School District (hereafter “LA Unified”), restructuring has been a frequently employed strategy for responding to a host of pressures that haunt policymakers and bureaucrats: fiscal responsibility, test-score improvement, safe and timely school facility construction, curricular innovation, grant compliance, student security, and, most recently, functional technological infrastructures. In the context of these pressures, this article questions the simultaneous development of organizational “decentralization” in LA Unified and the rapid emergence of new technology management positions across all levels of the organization.

Decentralization is a phenomenon worth studying because it highlights links between public institutions and the global political economy. Along with labor outsourcing, just-in-time production, computerized automation, and other flexible accumulation strategies, decentralization has been theorized as a post-Fordist organizational reaction to globalization (Harvey 1990; Hardt & Negri 2000; Amin 1994). Los Angeles has been identified as epitomizing these flexible production traits (Scott & Soja 1996; Monahan 2002), but thus far little research has been done on post-Fordist manifestations in large public institutions like school systems.

Information technology (IT) and its management are important catalysts of organizational change, and telecommunications infrastructures have been perceived as contributing directly to the spread of post-Fordist logics into private and public institutions (Castells 1996). In this light, I document an emergent group of IT specialists in LA Unified and analyze their territorial struggles as a microcosm of the mutations occurring in the organization as a whole. The main argument advanced here is that in spite of the strong rhetoric of decentralization in the District and in spite of the ostensible decentralizing valences of information technologies, a form of centralized control persists – yet is masked – within the organization.¹

¹ Organizational restructuring is not a new phenomenon in public education, but there is a discernable historical trajectory in restructuring movements that cannot be explained as back-and-forth swings of the same pendulum. Throughout most of the 20th century, educational restructuring has led to greater centralization, larger schools, more subjects taught, more middle management, and less teacher autonomy (Tyack 1990). A call for local control and experimental pedagogy in the 1960s led to a partial decentralization of school districts, typified by New York City’s Borough system, but the experiment did

LA Unified is morphing, I claim, though a process of *fragmented centralization*, such that decision-making authority is becoming more centralized while accountability for centrally made decisions is becoming more distributed down the hierarchy chain. This splintering of authority and responsibility gives the organization the appearance of responsible management but simultaneously decreases worker autonomy while intensifying workloads. I adopt the term fragmented centralization from David Tyack (1990) who uses it to describe New York's Borough school system, but I develop it to analyze issues of power within educational structures, incorporating what Jill Blackmore (2000) calls "centralized-decentralization" – the simultaneous existence of Fordist and post-Fordist attributes in educational organizations.

This study shares similarities with Vicki Smith's (1990) *Managing the Corporate Interest*, which tracked the recentralization of top management control and the elimination of middle management in the private sector in the 1980s as a direct response to global competition and instability. Working from a case study of a US banking firm, Smith demonstrated how middle managers who were not fired during organizational restructuring actively reinterpreted and selectively enforced the policies set by top management in order to mitigate the harmful human costs of new corporate structures and entrepreneurial cultures. Similarly, the case reviewed in this article perceives the group of mostly middle management IT specialists as active agents in the restructuring process who are, at once, contending with and bringing about organizational change, but with several key differences. First, unlike the downsizing of middle management in the private sector, I am describing the *growth* of a new managerial group of IT specialists; second, whereas employment is unstable in the private sector, it is all but ensured in LA Unified; third, and importantly, while the recentralization of top management control in corporations is openly publicized, it is happening covertly in the Los Angeles school system under the guise of decentralization and local autonomy. These differences may stem from the different natures and missions of private corporations and public institutions (e.g., service not profitability is the primary mandate for the public sector), but the simultaneous characterization of information technology as necessary and as inherently neutral has assisted IT specialists, as a new managerial group, in spurring the development of fragmented centralization in the organization.

not much alter the larger development pattern. Whereas in 1931 there were nearly 130,000 school districts in the USA, by 1987 there were fewer than 16,000 (Tyack 1990: 184). The current wave of restructuring should be seen, therefore, as a new mutation in the larger historical pattern of centralization.

The data for this study are derived from a year-long ethnography of technological change in LA Unified (Monahan 2005). From 2000 to 2001, I attended meetings of technologists at multiple organizational levels, from small groups at school sites, to larger groups with representatives from many schools, to policy-making groups at the central administrative level. I conducted fieldwork at a dozen school sites across the city, concentrating primarily on the development of infrastructure projects (e.g., wiring schools for Internet access), but also on the varied uses of computers by students and teachers. Finally, semi-structured, open-ended interviews were conducted with fifty individuals involved with technology development in LA Unified, including students, teachers, administrators, policy-makers, and contractors.

Drawing upon fieldwork and interviews with IT specialists, this article will first provide a map of emerging technology positions in LA Unified and will demonstrate how this heterogeneous group is altering organizational control structures that have traditionally relied upon – and reinforced – binary oppositions between administrators and teachers. Second, because the technology policies and infrastructures managed by these specialists are dramatically altering all aspects of organizational operations, the pattern of political conflicts and resolutions within this group will be analyzed as a representation and as an integral component of shifts toward fragmented centralization in the organization as a whole. Finally, these trends will be theorized for their connections to the global political economy.

Organizational Restructuring and Technology Projects

To an outsider, and probably to many insiders, the organizational makeup of LA Unified appears inscrutable. Employees, claiming to have seen multiple organizational iterations in their time, rattle off names for groupings of schools – families, clusters, regions, local districts, mini-districts. The current incarnation is called “decentralized” and consists of administrators and policymakers at central district offices located in downtown L.A. who set policies, establish programs, initiate construction projects, and otherwise oversee the operations of the District. LA Unified is then divided into 11 “local districts,” each with its own superintendent and administrative personnel who preside over an average of 73 schools and 68,000 students.² Each of these local districts is then further divided into

² The latest restructuring happened in the Summer of 2000 and was instigated as a response to the Belmont Learning Complex debacle, where a \$200 million LA Unified

“families” of schools, usually consisting of one high school and all the elementary and middle schools that feed students into that local area high school. In sum, the district consists of 80,325 employees who serve 746,610 K-12 students in 806 schools across 704 square miles (LAUSD 2004). LA Unified’s vast size makes it the third largest employer in the region (City of Los Angeles 2001) with an annual budget of \$13.35 billion (LAUSD 2004), and therefore vital to include in any study of economic and industrial trends in this global city.³ Yet, in all the research on industrial and regional transformation in Los Angeles, the school system has only been given peripheral attention, if at all – this article will serve, in part, as a corrective to that lacuna.

Organizational statistics and mappings render a surface description of LA Unified but fail to convey a sense of what this entity is. What is an organization, after all, and how can one move beyond surface significations to a deeper understanding of its operations? I approach organizations as *assemblages of categorical relations*.⁴ As such, building locations, chains of command, and budgetary controls can shift with only nominal effects on the quotidian functions or identity of the organization as a whole. One can approach the complexity of collective behavior and perhaps harness an understanding of significant change by studying the manifold relationships and power differentials, whether perceived or actual, among groups.

Periodic restructuring has reinforced, especially in areas of technology projects, the need for local self-sufficiency and informal networks. Building technological infrastructures requires not only financial resources but also a sustained vision and the cultivation of an expert community. Technology planners at individual schools have learned to insulate themselves from the vicissitudes of the District as an administrative body by strategically promulgating local autonomy and securing, whenever possible, financial

school was built on a 35-acre former oil field with toxic levels of hydrogen sulfide and potentially explosive methane (Smith 2000). As work continues on Belmont, it is reported to be “the most expensive high school project in America” (Moore 2002). Still, public demands for accountability and outcome assessment are part of a growing neoliberal cultural orientation that is a vital to globalization and that transcends isolated construction disasters.

³ Los Angeles County and the U.S. government are the first and second employers with 88,779 and 75,900 employees, respectively. By contrast, the Boeing aerospace corporation employs 38,000 workers (City of Los Angeles 2001).

⁴ My approach to organizations is informed by institutional theories that perceive organizations as socially embedded entities whose structures shape individual and collective cognition and behavior (Douglas 1986). Yet, as socially situated collectives, organizations are constantly co-constructed by informal and emergent practices, historical biographies, and contemporary contingencies (Scott 1995).

support from outside the District; schools have a history of applying for their own technology grants, for instance. Informal networks across LA Unified have been the mechanism that has allowed schools to achieve degrees of autonomy from official District projects and protocols.⁵

The development of technological infrastructures in LA Unified started as a grassroots endeavor at individual school sites and has only recently been centralized and standardized. As an example, individuals at one flagship high school that I visited, which serves an extreme low-income and minority student population of 4700 students, started building an infrastructure in the mid-1980s and boast that they had a fully functional network long before the District achieved one in the mid-1990s. These interviewees claim that they encountered nothing but resistance from “downtown” administrators who did not see any value in technology and were (and still are) mainly concerned with the production of statistics, not with meeting student needs.

Individuals at this school applied for a small technology grant over ten years ago and were soon after mysteriously contacted by the US Defense Advanced Research Projects Agency (DARPA), which asked the grant writers if they wanted assistance from the Department of Defense for a pilot program. One of the women at this school said she gave DARPA representatives a five minute presentation of her vision – a fully networked high school providing community access and leadership and resources for elementary and middle schools. She told me that DARPA responded by saying “great” and then awarded the school close to one million dollars and an on-site training person for six months. Individuals at this school have continued to maintain autonomy from the larger organization by applying for other grants individually because “the District was taking too long.” For instance, in the late-1990s they secured \$1.2 million from California’s “Digital High School” (DHS) program and \$4.2 million from “E-Rate,” the federal government’s technology discount program for schools and libraries.

This school’s success has set a model for schools in the rest of the District to follow, but its financial (and spatial) autonomy has also given it continued positional advantage over District officials and their technological mandates. The network administrator at this school related to me a story that affirms this point about territory control. He first pro-

⁵ Individuals at school sites also draw upon the larger public sentiment of bureaucratic mistrust to gain rhetorical advantage over the central administration. Because the mission of the organization is “improved student achievement,” those in everyday contact with students possess some symbolic leverage over administrators who seldom see any students.

fessed to be quite open to anyone visiting and viewing the school's equipment – a point that was supported by his gracious acceptance of my intrusion. Nonetheless, he continued, when two District sub-contractors came in recently and started tugging on the fragile fiberoptic wires of the school's network, he angrily forced them off of the school site.

A few days later the technology staff at this school received the District's technology plan for proposition BB, which is a local school bond measure, and they were aghast to see specifications for inferior hubs when the school was already using far more efficient switches. In response, the personnel at this school organized a meeting of technology coordinators from several schools and invited the downtown administrator charged with setting specifications. At the meeting, they informed the administrator that if they were given hubs, they would throw them in the trash, and other school coordinators seconded the threat. When I questioned the sincerity of this threat, the technology coordinator told me that they would have stuck the hubs in a closet somewhere to collect dust, but this does not undermine the effectiveness of this ultimatum: if the media were alerted to the fact that LA Unified was wasting taxpayer dollars on obsolete equipment that did not serve the needs of students, District administrators would feel the heat. A few days later, central administrators capitulated and distributed a new set of specifications that included an option for the more efficient switches.

This example of confrontation with central administrators illustrates how spatial territorial rights (control over what happens at school sites), degrees of financial autonomy (lack of dependency on the school system), individual insulation (protection from retaliation by those outside of the school), informal networks (mobilizing a community of practitioners), and symbolic leverage (tacit threats of whistle-blowing to the media) act together to create a context for appropriate technology design. Within this context, technology staff act as agents who can draw upon their histories of success to modify policies even when these individuals occupy lower institutional positions than central administrators. The power balance described here is quickly changing, however, and local control achieved through grassroots mobilization is being lost. In order to understand how and why, we must first map the emergence of powerful new positions in LA Unified.

Emergence of IT Specialists

In *The Visible Hand: The Managerial Revolution in American Business*, Alfred Chandler (1977) identifies a moment in modern industrial capitalism from the late 19th to early 20th centuries when a many-tiered, hierarchically

ordered managerial “class” arose to govern complex, multi-unit businesses through “scientific” control of all the stages of production and distribution. This “class” dramatically altered both the nature of businesses and the markets in which they operate, ushering in a period of Fordism predicated upon systems of mass production, mass consumption, and scientific management. Building upon this work, I would assert that the post-Fordist era of flexible accumulation, just-in-time production, small-batch production, and labor outsourcing is being accompanied by an analogous rise of a managerial group of IT specialists.⁶ While my data are drawn from a service-oriented organization in the public sector, I expect that similar developments are occurring in service, manufacturing, and other industries in the private sector as well.

The history of public school systems across the country is marked by persistent conflict between administrators and teachers; traditionally, this has been a gendered struggle, with men occupying the administrative roles and women the teaching roles. The many phases of educational technology to hit the schools throughout the 20th century – film, radio, television, personal computers – were impelled by these male administrators who wanted to revolutionize learning through various mechanizations that would *coincidentally* diminish the autonomy of female teachers in classrooms (Apple & Jungck 1998; Cuban 1986). While administrative colonizations of classroom activities are stronger than ever, in the form of standards, benchmarks, and compulsory testing, the latest wave of educational technology to hit the schools has grown out of teachers’ efforts within schools. As illustrated with the high school example provided above, the catalysts for Internet access were teachers with a technological bent, a good many of whom were women.

⁶ Many social scientists would question the independence of the managerial class and consequently its label as a class versus some other designation such as status group, occupational group, or stratum (e.g., Bell 1980). Following from Barbara and John Ehrenreich (1977) who posit the rise of a “Professional-Managerial Class” (PMC), I perceive information technology specialists as comprising a new occupational stratum within this growing PMC: regardless of the lack of unity among them, these specialists are collectively ushering in new forms of technological life. But, perhaps the classic Marxist definition of class as tied to economic determinants, such as relationship to ownership or means of production, is becoming less relevant in the post-Fordist era when people no longer perceive themselves as class members or act in class differentiated ways, and when other determinants such as race, gender, education, or religion continue to play major roles in structuring life chances. This is not to say that class should not be studied and economic inequalities corrected, only that such corrections would only be one step toward achieving a just society.

Whereas all the mechanical advances of the past failed to stick, yet alone revolutionize education, the Internet and multi-media production appear to have taken hold. The reasons for this are complicated, probably having more to do with the wider media-generated cultural belief that computer access provides social empowerment than with school politics and practices; however, the grassroots origins certainly resonate with practitioners and lend the movement legitimacy. Perhaps more important for the continued utilization of new technologies are the accompanying infrastructural investments and spatial reconfigurations: when \$403 million was spent over 2000-2001 alone on technological infrastructure in LA Unified (Konantz 2001), material and financial investments stoke the fires of the technological imperative. Furthermore, these material conditions of commitment seemingly mandate the creation of official IT positions within school districts to manage the technologies, and these positions, I argue, split the classic dichotomy between administrators and teachers, leading to profound destabilizations of authority and responsibility and to many contentious turf wars.

It is difficult to provide a descriptive representation of IT specialists in LA Unified because this group is not homogeneous or cohesive. What binds specialists together as a group is their relative technical expertise, vis-à-vis other employees, and their commitment to the use of IT in schools. By saying that this group of IT specialists is destabilizing traditional power relations, this means that they are increasingly influential in making decisions about operations in the district. This includes not only technology policies that govern equipment purchases and infrastructure design, but also technology policies that shape curricula, information reporting, and space allocations. I am not saying that IT specialists are necessarily in charge of the organization's hierarchical network, that they always agree, or that their decisions always trump those of administrators or teachers, only that their influence is strong and their presence is growing. The goal here is to map this group that has emerged during the past decade in order to learn about what kinds of power they do have and how they are contributing to fragmented centralization.

There are many strata of IT specialists and the organizational terrain is in flux, so, in the spirit of California's predictably unpredictable – yet assuredly present – seismic activity, consider the following outline of IT positions a contingent topographical sketch (see Table 1). At the geographical plate of school sites reside *technology coordinators*, *network administrators*, and *support staff*. Technology coordinators oversee the operations at individual schools, including implementing ad-hoc networks, negotiating with contractors and facility managers, creating mission statements for long-term technology development, purchasing computers, furniture,

peripherals, and network devices, supporting and fixing school equipment, etc. Over the past ten to fifteen years, technology coordinators have applied for grant money and used it to meet what they perceived to be the specific needs of their schools, and they now increasingly decide on space allocations (classrooms, storage closets, and offices) and supervise network administrators and support staff. Currently, most high schools have some form of technology coordinator position, even if the responsibilities are shared among multiple teachers without additional salary benefits. Dedicated coordinator positions are rare below the high school level.

Table 1: Strata of Emerging IT Occupational Groups in LA Unified

| <i>Stratum</i> | <i>Group</i> |
|--------------------|---|
| School Site | Technology Coordinators Network Administrators Support Staff |
| Local District | Instructional Technology Applications Facilitators (ITAFs) Complex Project Managers Business Managers |
| Central District | Program Administrators Information Managers Technology Administrators Policymakers |
| External Providers | Contractors Vendors |

Network administrators ensure, at a root level, that systems are functioning properly, from server efficiency, to printing capability, to user logins, to data backups, to security protections, and more. Yet in most cases that I saw, network administrators collaborated closely with technology coordinators to manage the social as well as the technical components of system operations. They supervised support staff, assisted teachers with hardware problems, and advised technology coordinators on equipment purchasing and implementation plans. Granted, at the moment, many high schools and most middle and elementary schools cannot fund and therefore do not have these positions.

At the high school level, support staff positions have the label of “teach-

ing assistant” (TA) and are occupied by college students or current students at the school. The division of labor I observed was one where college TAs primarily fixed non-operational equipment and installed networks while student TAs assisted teachers and supervised activities in computer labs. At the site where I did most of my fieldwork, there was some fluidity with these responsibilities when the technology coordinator or network administrator told college TAs to perform some non-maintenance task or when college TAs selectively permitted student TAs to enter their space. Students in both TA positions frequently reminded me that they were severely underpaid for the technical work they were doing: college TAs received \$9 an hour while student TAs received the federal Title I “student aid” wage of \$5.15 an hour (state minimum wage was \$6.75 at this time). On the other hand, TAs’ conviction of being underpaid, which was a belief shared by the technology coordinator, provided these employees with a rich rationalization for engaging what Michel de Certeau (1984) calls *la perruque* – diverting work time and resources for personal projects such as gaming, doing homework, or searching out and comparing specifications for computer hardware they were personally interested in.

At the geographical plate of the local district, the primary IT position is that of *instructional technology applications facilitators*, a cumbersome title that compels everyone to refer to these individuals as “ITAFs.” The functions that ITAFs actually facilitate are communication, translation, and negotiation between school site technology coordinators and central District administrators. For example, when contractors fail to perform their tasks and leave schools with gaping trenches or non-functional networks for months on end, technology coordinators contact ITAFs who then find out what is going on and lodge complaints with central administrators to get things moving again. To a lesser degree, at least during this initial infrastructure-building phase, which is the focus of my study, ITAFs organize teacher development sessions and facilitate the placement of technology teachers and coordinators throughout the District.

There are other important technology roles, if not positions, at the local district level that involve providing contractors with blueprints of schools and sometimes walking them through these facilities, inspecting completed networks and requesting changes, and “signing-off” once networks are completed to specification. Traditionally, these tasks fall under the responsibility of *complex project managers*, but many of these people do not have the necessary expertise to plan for or evaluate data networks, and in at least one case that I observed, these tasks fell under the purview of *business managers* in local district offices. I expect that a position or

positions will solidify around this facilities role in the near future, but at the time of my research, ITAFs and technology coordinators were in the dark about whom they should contact to perform these duties.

At the geographical plate of the central district, technology personnel include *program administrators*, *information managers*, *technology administrators*, and *policymakers*.⁷ There is an Information Technology Division (ITD) and an Instructional Technology Branch (ITB), each with their own internal structures, but because crucial technology tasks are distributed to individuals who are not formally associated with ITD or ITB, I have elected to adopt these more inclusive categories. All program administrators, who are often called “district level ITAFs,” are located in downtown Los Angeles, but they are spread out in separate building locations: some in the main LA Unified facilities at 450 North Grand Avenue, some in imposing skyscrapers further down on Grand, and others in the labyrinthian, 3rd Street Annex. Program administrators oversee large-scale construction projects, such as the networking of all 459 schools that qualified for E-Rate funds – a monumental task with an imposing deadline that was divided between four contractors: IBM, PacBell, Vector, and Wareforce. Other program administrators manage the specifications and distribution of computers that are purchased through state grants, such as California Assembly Bill 2882, which allocated funds to reduce the student-to-computer ratio to 4.75:1 in all public high schools. Finally, some program administrators serve more of a recognizable ITAF function of organizing staff development sessions.

Information managers deal with the technical side of technology use in the central district. Network services personnel, statisticians, and auditors all fall under this category, and some sample tasks include monitoring the student information system (SIS), centrally maintaining Internet access for schools and staff, updating web-content on LAUSD.NET, producing reports for policymakers, conducting software audits, and performing a host of related activities.

The presence of technology administrators represents a major development in the value placed on information technology and on information

⁷ It is important to note that many central and local district IT people originated from school-sites and climbed into these positions over time. This means that while the organizational and geographical location of IT positions does partially determine the dispositions of individuals, there is a significant temporal blurring of these categories-in-flux. This does not indicate, however, that IT groups maintain an up-to-date awareness of and sensitivity about the constraints and responsibilities of their organizational counterparts.

derived through the use of technology.⁸ These positions carry titles like “assistant superintendent,” “chief information officer,” and “chief technology officer,” and their organizational and physical proximity to Board of Education members and the superintendent is a sign of their increasing importance and influence. The primary tasks of technology administrators are supervising programs and serving as liaisons between policymakers and program administrators. In this second capacity, the position is isomorphic to ITAFs who mediate between local and central levels: technology administrators provide information to policymakers, gently negotiate policies with them, communicate those policies to program administrators, collect information and suggestions from these staff members, and translate that information back to policymakers in the form of policy recommendations.

Finally, policymakers are gradually becoming much more interested in crafting technology policies and evaluating the cost efficiency and, to a lesser extent, the educational efficacy of technology programs. There is a Business, Finance, Audit, and Technology (BFAT) standing committee of the Board of Education, comprised of four Board members and three outside members, that generates its own policy agendas, orders reports and takes policy recommendations from technology staff, and then proposes policy to the Board of Education as a whole. Examples include the creation of acceptable use policies that comply with the Children’s Internet Protection Act (CIPA) of 2000,⁹ establishing a District-wide information technology plan, and implementing the Waterford Early Reading Program – a computer-based, automated reading program approved in 2001 for 244 elementary schools at the cost of \$44 million (LAUSD 2001). Additionally, the fact that several Board of Education members have worked for private technology companies further attests to the convergence of technology and policy interests.

⁸ I call this trend a “development” rather than a departure, because the key financial and assessment functions of the District have depended almost entirely on standardized, quantified information for some time. The figures for student “average daily attendance” determine the number of tax dollars allocated to the District for educational operations, and the figures for student performance on the “Stanford 9” standardized test determine the ranking of schools on the “academic performance index,” which is used to ascribe educational success or failure both within and without the District. Both of these functions are validated by a technological culture of information generating, processing, and storing.

⁹ The Children’s Internet Protection Act (CIPA) contains provisions for establishing acceptable use policies and filtering “objectionable” Internet content. It was deemed unconstitutional by the United States District Court for the Eastern District of Pennsylvania on May 31, 2002 (Clark & Wasson 2002). Then, the Supreme Court declared CIPA constitutional on June 23, 2003.

The last geographical plate holds a group of IT service and product providers associated with LA Unified but technically outside of the organization proper. I choose the terms *contractors* and *vendors* to differentiate, respectively, between the services and products they provide, but in conversation the categories are often conflated. Contractors and their host of sub-contractors are responsible for District-supported, as opposed to ad-hoc, technological infrastructure construction or alteration. This group is worthy of being included in any analysis of IT specialists within the organization because not only do they reconfigure space and by extension pedagogical practices, but they also actively negotiate with program administrators and others over specifications. Moreover, even when digging-up schools, tearing through walls, and drilling through ceilings, contractors must interpret *how* to perform their tasks to the agreed upon specifications in materially messy contexts – they must make on-the-fly decisions about where to put data-drops or what to do when they encounter plumbing not sketched on blueprints, for instance.

A similar case can be made for vendors, such as software or hardware providers. These people often cultivate relationships with technology coordinators over many years. Trusted vendors can recommend products that are then used to modify educational environments and experiences. At the district level, some vendors develop exclusive, if perhaps illegal, relationships with program administrators or employees in the purchasing department, and they inflect the technological configuration of schools through these alliances.

Across these four imbricated strata (school site, local district, central district, and external providers) I have plotted positions that, taken as a whole, constitute a powerful present and emergent IT occupational group. This IT group, while clearly not homogeneous or unified, is gradually gaining authority over the domains previously controlled by other groups. At the school site, for example, technology coordinators are in some cases able to charge onto the hallowed ground of teachers and administrators – classrooms and offices – and requisition these spaces for technological purposes, such as computer labs. At the other end of the spectrum, technologists at the main District offices have all but taken over one of the largest buildings (the “G” building), they wield an enormous budget (over \$400 million per year), and they drive curricula changes (e.g., the currently mandated, software-based Waterford reading program referred to above).

If this occupational group of IT specialists could be seen as ushering in a particular rationality, in a parallel manner to the Fordist one of the managerial “class” that Chandler depicts, I would describe it as post-Fordist. Similar to managerialism, the IT occupations embody a technolog-

ical and scientific imperative, manifested as a fervent belief in technological progress and in many cases quantifiable measures (of student-to-computer ratios or test scores). At the same time, the IT specialists are wrapped-up in a process of decentralization that places more responsibility on individuals for self-management and flexible adaptation to organizational changes.¹⁰ Finally, a litigious culture of contract and license compliance and associated audits, what Marilyn Strathern (2000) has coined “audit culture,” imposes self-discipline upon IT and other employees and restricts policy possibilities. What is interesting about this transition period is that value systems are not uniform across IT groups and design processes are clearly contingent and constructed, so conflict is as visible as agency in this liminal terrain.

Political Strategies of the IT Specialists

Thus far this article has offered rough maps of the current organizational structure of LA Unified, the emerging IT occupational group within that structure, and the grassroots history of technology efforts. As Michel de Certeau (1984) reminds us, however, “What the map cuts up, the story cuts across” (129), so the next sections will begin to fill in some of that missing story by analyzing the motivations and negotiations of District technologists across organizational domains. Not only is information technology an important catalyst of organizational change but the specialists charged with managing IT infrastructures and projects act directly as agents of that change.

One Board of Education member I interviewed claimed that technology, through the information access it enables, is breaking-up existing territories and creating a positive “power vacuum” in the District. She further explained: “You don’t have power based on information as much anymore, because so much is available on the web. And the more we can get onto the web, the less people can hoard information and use it for power chips.” In the context of our conversation, I understood her to mean that IT creates a state of transparency with policymaking and subsequently equalizes bureaucratic control. Judging by the elaborate, stratified group of IT positions documented in the previous section, one might counter that any existing organizational vacuum is quickly being filled by technologists. I would like to proffer, however, a more nuanced

¹⁰ The stress on individuals flexibly adapting rather than on organizations being multiply enabling is documented in Emily Martin’s (1994) research on corporate training.

reading of the situation. I would place agency into the hands of IT specialists and assert that *technologists are restructuring the relational networks that constitute the organization*. By drawing upon cultural myths of technological imperatives, which present technologies as correctives for social and economic inequalities, the IT specialists are able to insinuate themselves into influential organizational positions and then deploy an infrastructure that necessitates continual upkeep and upgrades by individuals in these occupational groups. IT positions, in other words, are validated by the materialities and dependencies they facilitate.

In some cases, this strategy of constructing relations of dependency is conscious and intentional. Take the following passage from an interview with two information managers (M1 and M2) in LA Unified's Information Technology Division (ITD) as an illustration:

M1: If technology truly becomes an integral part of our everyday [lives], you can't live without it. Like the book, like the chalk – no one would debate that there should be a classroom without a whiteboard, chalkboard, whatever. Nobody would debate that any teacher should have books or be able to provide a place for that child to sit.

M2: What if every teacher did their attendance on computer, period. No more role books; no more turning in paper stuff. It's all done on the computer. You think that network wouldn't be up 99.99% of the time? This is our income! [Meaning that the school district relies on attendance reporting for its income.] That network would work! And it would be supported at the school level, and at every level. So –

M1: So if it truly becomes an integral part of our daily administrative and instructional, whatever, basis, then there will be no choice but to find a way to make sure that it's supported. Why? Because *even* the board member who doesn't have e-mail for an hour will be freaking out, and when they're up there voting, they're saying: "But I remember what it was like when I wasn't getting my e-mail or when I tried to watch, to do that Powerpoint presentation," because it becomes an integral part of my daily life. When the superintendent is doing email – and they're all doing it now, they're starting, and they're becoming very dependent upon it – or going to a website to get information or to find out what the District is doing, or any of that stuff. Or the sharing of knowledge and all that stuff. If it stays on the fringe, it's easy to take off. That's why I always used to go out to schools and say, "I don't believe in instructional technology plans; I don't believe in instructional technology plans. What I believe in are instructional plans that have technology woven into them. So, if you give me an instructional technology plan and the *instructional technology plan* is here and your *instructional plan* is here, you know what? That's useless to me; it's useless to the school, because as soon as you can't do something because you don't have the money, or the resources, or the people, or the time, or whatever, ah you know what?"

‘Oh we’ll start this one in six months, but this one is required.’ Don’t do that; do an instructional plan with technology woven into it. End of story. It’s not an afterthought; it is a part of your everyday lives.”

What you’re describing sounds like a litmus test, that if it becomes integral to instruction too, not just –

M1: Absolutely, to every element, to every element.

record-keeping, then it will be maintained and –

M1: Absolutely.

and someone will support it. And if people, whether it’s the larger culture or it’s just not integrated, if they decide this isn’t really important to learning, then it’s going to –

M1: They won’t.

– be cut.

M1: I don’t think anyone will every say, “This is not important to learning.” It’ll be, “You know, we’re faced with the sheer nature of we have to cut something. Which finger would you have me cut off?”

[Laughs]

M1: Right, okay? I wouldn’t want to choose any of them! But you know what? “I need to do this; I need to do this; I need to do this; I need to do this” [He counts on his fingers]. Which one do I need to do more, and which one can I live without? And if it’s not an integral part, then I can live without it.

One of the primary motivating reasons for integrating technology seamlessly into the educational environment is a concern that IT jobs will be modified or redistributed in the near future (keeping in mind that few people are fired when the school system is formally restructured). Granted, no technologists expressed instrumental personal reasons for desiring integration (most do believe in the efficacy of technology for teaching and learning), but many articulated concerns about what would happen when the current inflow of federal, state, and local grant money dried up.¹¹ A program administrator vocalized this well:

¹¹ Most of my interviews with technologists were conducted from January to June of 2001. In June of 2002, ongoing and promised funding for technical support and training under California’s Digital High School program was “deferred” for at least the next year and perhaps indefinitely, verifying concerns over the long term sustainability of IT in public education, particularly in the wake of severe State budget shortfalls (California Department of Education 2002).

If what happens is what I'm reading is going to happen, we're going to see a dip in financing and everything in terms of schools getting funds. We're probably also going to see some of things that we've got going take a hit. One of those will be support personnel: ITAFs [and] if we happen by some miracle [to] get the network support people [at school sites], we'll see them go by the wayside first. And that may, if it's at the wrong time, we'll end up with a lot of metal on our hands, a lot of metal and plastic, and nothing to really show for it.

That must be a major concern.

A: It is, and one of the things I'd like to make sure we keep in the forefront is that the least amount of impact we have in installing these things, and the more it seems to be part of the environment as we go through it and keeping everybody up to speed, the more entrenched it'll become and the less easy it will be to rip this stuff out.

Interestingly, the potential threat to IT positions is not perceived as occurring across the board. Most interviewees saw technology coordinators as protected by their school "fiefdoms" – insulated realms that would find a way to keep crucial technical positions intact, whether by allowing teaching leave, or through Title I,¹² or through some other funding arrangement. Similarly, the IT people at the central district level see their positions as ensured by means of the vast technical and social infrastructure they oversee. It is the ITAF positions at the local district level that are at greatest risk, perhaps because they are nomadic in nature: ITAFs wander from school site to school site, organize professional development meetings, and otherwise mediate between local and central levels. Without a social *and* material infrastructure to justify their positions, and without a secure sense of place (schools and downtown offices are entrenched fortresses compared to the recently created local district offices), ITAFs may have little leverage to defend their stations, but they can tactically migrate to new positions when their jobs are jeopardized – probably by emphasizing the instructional and training parts of their job descriptions instead of their technical management skills.

So, where the Board member's comment about a "power vacuum" implies that technology is an equalizing force that neutralizes power asymmetries in the organization, this interpretation elides the agency of

¹² Title I is the largest Federal aid program for education. It originated with the Elementary and Secondary Education Act of 1965 and was then reauthorized with the Federal Improving America's Schools Act (IASA) of 1994. It is awarded to schools in high poverty areas (determined by number of students receiving subsidized meals or by other measures) to help meet the special needs of those student populations.

the IT specialists to nurture dependencies that happen to grant them more job stability and resource control in LA Unified. In some cases, technology may enable equal access to information and thereby correct power imbalances caused by information hoarding. That said, giving all the volition to technology sets up a false sense of *fait accompli*, serving as a discursive *splitting-and-inversion* strategy (Latour & Woolgar 1986) – where fact construction is separated from the outcome – that deflects attention away from the many individual choices made and actions taken in the design process.

Fragmented Centralization as an Organizational Structure

The unfolding of IT projects and programs in LA Unified establishes an identifiable pattern of *fragmented centralization*, meaning the simultaneous centralization of decision-making authority and decentralization of accountability (across multiple peripheries) for the measured “success” of those decisions. This trend in relationships among IT groups serves as a barometer of similar sea-changes in the organization as a whole, even as these new organizational relations are codified by the technology policies and infrastructures managed by this group. One high-level technology administrator put it succinctly by telling me that the underlying goal for all technology decisions was “standardization without centralization.” If this is the case, then the question of where standards are set and by whom determines where power is shifting to, on the one hand, and where autonomy is lost, on the other.

The term fragmented centralization describes the latest development in the organizational restructuring of public education, while specifically accounting for power-shifts that are occurring during this process. Fragmented centralization is a theoretically helpful concept because by attending to multiple peripheries across the organization, it avoids the false dualism of centralization-decentralization, which is a corollary to the core-periphery dualism found in research on world systems (Nash 1981; Wallerstein 1990). Moreover, fragmented centralization is an appropriate descriptor for Los Angeles institutions, because the city itself has long been recognized as a “fragmented metropolis” of uneven development and economic inequality (Fogelson 1967), and the school system molds itself to these urban and social conditions.

The impetus for the contemporary process of fragmented centralization in Los Angeles has its roots in globalizing pressures that are felt in many sectors, both public and private. Over LA Unified looms the shadow of privatization, which could be the bane of public institutions in this

era of neoliberalism. Fear of privatization, dissolution, or state takeover compels the city government to provide a semblance of local accountability and responsiveness. Furthermore, what has been called the post-modern urban form, characterized by suburbanization, edge cities, and gated communities (Dear 2000), establishes a political topography that may motivate fragmented centralization, especially within public institutions. As Michael Dear (2002) explains, “it is no longer the center that organizes the urban hinterlands [in Los Angeles], but the hinterlands that determine what remains of the center” (16). The center, in this case the central offices of the school district, must give the appearance of being responsive and accountable to demands from the periphery or risk losing almost all control over policies and resources. This risk is made palpable by the example of the growing San Fernando Valley secession movement, which recently gained ground by getting a ballot measure approved for the November 2002 elections. Although the measure did not pass, policymakers are certainly aware of and responding to this ever present possibility.

In LA Unified, the decentralized form of 11 “local districts” accomplishes a type of local responsiveness, but by giving each of these local districts moderate budgetary control, this form also abdicates central authorities of responsibility. A sense of arbitrary restructuring for the sake of inoculation against an externally enforced break-up of the District is prevalent. As one program administrator expressed:

I don't think that the restructuring of the District has had much effect one way or the other, other than appeasing those people that were looking for a break-up of the District. I think it's held that at bay a little longer. I don't think it's produced any kind of positive effect yet in terms of student achievement – it may. I do think that it's brought localized control, which can contribute to student achievement, but again, there's your five-year rule [meaning the District is restructured on an average of every five years]: we won't know. The problem is we may have people making decisions again in two years. We were joking this morning at lunch: “What's it going to be next? Are we going to be eight districts, nine districts, are there going to be letters, numbers?” And each of us is talking about all the things we've gone through in our careers at LA Unified.

How many restructurings?

Well, we've had zones, districts, little districts, clusters, regions, areas, you name it – going back 20, 25 years. It's kind of funny the way we do these things.

Yet, in spite of surface efforts at decentralization, it is my contention that a high degree of central control is maintained: most policies are still

set by Board of Education members, purchasing is centrally coordinated, average daily attendance and payroll time reporting are still centralized, legal counsel and auditors still operate centrally, and IT decisions are almost all made now by central administrators. Financial allocations over personnel in each school and in each local district are determined by a formula, set centrally, that allots personnel budgets according to the number of students served in that school or local district, respectively.

In the IT realm, the process of fragmented centralization is marked by a series of colonizations of previously protected territories, and these colonizations occur under the rhetorical cover of power vacuums, neutral technologies, and technological imperatives. In addition to what I described above as space and budgetary controls absorbed by IT specialists, examples of territorial invasions and centralizing trends are manifold:

- Librarians who guarded computer passwords in attempts to regulate Internet use by students are foiled by the establishment of a central system of school-level student IDs and passwords, thereby diminishing librarians' gatekeeping ability.
- Teachers who have a history of teaching computer classes are suddenly told that only math, computer science, business, or vocational teachers are equipped to teach such courses – unless, of course, such experienced teachers wanted to bypass this arbitrary ruling by undergoing training for an “add-on credential.”
- Centrally located administrators now set specifications for computer equipment purchased for schools, whereas previous specifications for equipment purchased with grant money were set by individual schools. The onus is then placed on resource-strapped IT staff at schools to support multiple platforms without any extra assistance.
- Central administrators determine and coordinate construction timetables and hardware specifications for the federal government's E-Rate program, whereas schools handled such arrangements themselves in the past. Oftentimes the burden falls on individuals at school-sites, who must pursue individual contractors or pressure ITAFs to figure out why construction has stalled and how to get it started again.
- Policymakers and central administrators have now set rules to preclude any new technology grants submitted by individual schools; grants now must be orchestrated by the central district. Moreover, all grants must now accord with the newly written “District Technology Plan.”
- The Instructional Technology Commission's (ITC) on-line discussion group, which has grassroots origins and has been a place for open exchange of ideas, is now seen by participants as being “policed” by central administrators who publically reprimand anyone who questions

their authority or decisions. This results in many participants self-policing their own contributions for fear of making enemies.

- Central administrators chastize school-site technology coordinators who want to participate in specification-writing, telling them that the job of technology coordinators is to demonstrate, through standardized tests, that computers augment student learning. Here, the inclusion of local knowledge in decisions is restricted, but determinations of the efficacy of computer use in education, which should have been made at the policy level, are delegated to school-site personnel.

The point in enumerating these many examples is not to say that all central control has negative effects, but rather to illustrate a general organizational trend: participation and autonomy are diminished at the local level as decisions are centralized, yet labor and accountability are simultaneously intensified for those on the periphery.

Decentralization of responsibility for centrally made decisions, on the other hand, can be seen in almost every aspect of public education, but especially in policies concerning information technology:

- Local districts and individual schools must directly contend with centrally managed but incomplete telecommunications networks in schools. This includes both the instructional burden of teaching mandatory “technology standards” to students when the equipment is non-functional and the material burden of navigating around partially completed construction projects that leave classrooms closed and trenches exposed across school sites, sometimes for well over a year.
- Policies on instructional curricula, standards, and testing are set by centrally located administrators (sometimes at the state or federal level) and reinforced through prescribed instructional software, but individual schools, teachers, parents, and ultimately students are held accountable for successfully executing those policies. This phenomenon is brought into stark relief with such punitive measures as putting entire schools “on probation” when students fail to improve their test scores.¹³
- LA Unified requires that acceptable use policies (AUPs) and release

¹³ This is a central component of President Bush’s “No Child Left Behind Act” of 2001. One deleterious effect of this new accountability regime is that good teachers in schools serving poor neighborhoods have incentives to relocate to wealthier neighborhood schools rather than be held responsible for the sub-standard performance of needy students. This incentive structure is then replicated across school districts, as school superintendent Roy Romer (2001) explained, when credentialed teachers relocate to neighboring and better paying school districts, leaving LA Unified with 25% non-credentialed teachers.

forms be signed by every student and by parents or guardians of minors; otherwise, students are unable to use the Internet in any classes or in school libraries. These documents remove all legal burden, whether from lawsuits or for crimes, from the District, placing it squarely on the shoulders of students and their parents or guardians. Until students turn-in these documents and pass an Internet etiquette test, they are unable to use computers, in spite of the fact that networked computers are now being placed in every classroom and “technology standards” are pushing all teachers to use the machines. AUPs and Internet tests represent another facet of fragmented centralization: computers may be reputed as valuable and necessary by those deciding technology policy, but any foreseeable or unforeseeable risks resulting from that “necessary” use must be taken by those who are most vulnerable.

Rationales for fragmented centralization are clearly embedded in and constrained by larger political and cultural contexts. First, the design of large technology grants that are tied to student poverty levels (like the federal E-Rate program) or to low student performance on tests (like local bond measure BB) or to number of students in a school (like California’s Assembly Bill 2882) all lend themselves to central administration in order to ensure equitable resource distribution and grant compliance. Instead of dealing with each school or local district on an individual basis, those awarding grants would prefer to simplify the process by outsourcing the assessment of needs and the routing of resources to main district offices. As one LA Unified program administrator related to me: “It’s a matter of efficiency. If I can get one guy in L.A. to give me all the data I need – you’re looking at the one guy – it’s a lot easier than if I have to hear it from 126 different schools.” This point was then affirmed in an interview with a policymaker in the Governor’s Office for the Secretary of Education.

Second, the management of grants quickly becomes work of creative financing that lies beyond the resources of most schools or local districts. There is not sufficient space to explain this in detail, but here is a quick introduction to this accounting complexity. The federal E-Rate program is really a “discount” technology grant that requires a financial outlay from other sources, such as school districts. Digital High School (DHS) is a state-sponsored grant that requires matching funds from another source. LA Unified does not match the funds out of its general budget, but instead draws matching for DHS from E-Rate, and vice-versa. Things get a step more complicated when grants used to equip schools, such as Proposition BB and E-Rate, have different technical specifications for network equipment – CAT5 cable and hubs, and fiberoptic cable and

switches, respectively. Then to ratchet everything up one more notch, E-Rate has a rigid time limit for completion; otherwise, the funds are forfeited. And because all construction must be competitively bid upon and there is a dearth of able contractors in the area, E-Rate schools are prioritized. This, in turn, requires a holistic view of District construction projects, but it is not clear, even to those in management positions, whether such prioritization (of some student populations over others) is legal.

Third, the appearance of professional computer networks in schools is important to policymakers, parents, and other visitors, but professional appearances cost more money and cannot easily be achieved by school-site employees. Technology administrators and policymakers stressed this point by saying that the District needed to move from “hobbyist” to “enterprise” approaches to technology design, and that the “home-brew” history of network projects in LA schools – which often looks sloppy, with cables dangled from drop-ceilings and strapped to the outside of electrical conduit – had to give-way to clean- and neat-looking designs by professionals.

Finally, the material components of technological networks, something often neglected in analyses of technology, may themselves act as gravity-wells that compel central control in spite of the many unbound web metaphors used to describe them. In LA Unified, all the mainframe servers for data collection, storage, and Internet routing are centrally located in the “G” building of the main district offices on Grand Avenue. They are visible at the entrance to the ITD offices, impressively shielded behind a glass enclosure and forbiddingly inaccessible without an authorized key card. It is here, and not the Board room or classroom, that the primary business functions of the District are managed: payroll time reporting, average daily attendance, student information system, decision support system, purchasing data, budgets, and Internet routing. So, despite the model of 11 semi-independent districts the hard-wired information networks continue to be sited downtown because efficient and secure technological design dictates it.

Each of these rationales for central control of IT and its design are embedded in ideologies and interdependencies that link LA Unified to globalization processes. The allocation of public grant monies for needy student populations has its impetus in rhetorics of digital divides and national competitiveness (Monahan 2001), where discursive themes stress either the need for computer literate students entering a global workforce or the economic necessity of supporting technology industry in the USA. The management of multiple grants becomes a two-sided coin of securing outside funding and ensuring legality every step of the way. These two sides are linked by the fact that debacles in design processes –

such as LA Unified's Belmont Learning Complex, which was accidentally built on a toxic site – imperil students and waste public funds, thereby diminishing public support for the organization as a whole and jeopardizing future bonds or grants. Unfortunately, the combination of needing to secure outside funding, comply with the legal stipulations on that funding, and engage in competitive-bidding processes places public education in the procedural confines of “free market” inflexibility.

The appearance of professional computer networks matters most for convincing visitors to classrooms – diplomats, superintendents, principals, parents, or researchers – that state-of-the-art education is occurring in those spaces; such appearances generate a symbolic, if specious, bridge for students to cross over from classroom spaces to the business environments that such classrooms emulate. Finally, the centralizing tendencies of technological infrastructures that have their origins in military contexts (Edwards 1996) now manifest themselves in what Saskia Sassen (1991; 2000) flags as the “concentrated sited materialities” or “global cities” of service support structures for global capitalism. The insertion of technological networks into schools plugs education (and the production of computer literate students) into this wider grid of global flows and dependencies.

Fragmented centralization is not simply the reproduction of centralized management control of the past. Instead, fragmented centralization is a unique form of centralization that allows for the decentralization of certain responsibilities as part of its structural logic. Centralization is now a stealth endeavor hidden in the seemingly apolitical setting of specifications and standards while risk and responsibility are fragmented and copiously distributed to those on multiple peripheries throughout the organization.

A Post-Fordist Organization?

So far, this article has mapped emerging technology positions in LA Unified and argued that this group is not only disrupting classic power dichotomies in the organization, but that it is an important agent of organizational change toward fragmented centralization. The stratification and geographical dispersal of IT specialists allows this group to be seen as representative of broader political conflicts and structural changes occurring in the organization. This section questions more directly how the changes in LA Unified connect to or reflect trends in the global political economy.

It may not seem intuitive to analyze post-Fordist structures within public institutions, because post-Fordism has been used predominately to

describe private companies. Unlike corporations, public institutions have competing social *and* economic missions and radically different governance structures, but these differences make the organizational changes underway all the more important to study. After all, the public sector – from education to welfare to security – is being privatized rapidly, yet the implications for organizational missions or public experiences are very poorly understood at this stage. Therefore, while it may be analytically useful to maintain the differences between public and private institutions, it is not necessarily empirically accurate or theoretically productive to view them as separate and distinct.

Of the main strands of post-Fordist theory, the *flexible specialization* approach of Michael Piore and Charles Sabel (1984) outlines the ideal type of an individually empowering and productive organizational structure and provides a comparative perspective for evaluating the constitution of LA Unified. According to this model, as summarized by Ash Amin (1994), the ideal flexible organization will demonstrate these arrangements:

division of tasks within the production cycle . . . reintegration of research and design, management, white-collar and blue-collar work . . . reversal of the Fordist and Taylorist tendency towards deskilling and worker isolation, through greater reliance on skills, polyvalence, worker participation and collaboration . . . decentralization of decision-making authority . . . deployment of multi-purpose technologies (rather than task-specific ones) . . . [and] the sedimentation of a culture of cooperation, trust and negotiability between firms. (21)

Many critiques can and have been leveled at flexible specialization as a model of what post-Fordism is or should be, namely that it is market deterministic and that it uncritically romanticizes skilled, craft production. My purpose in invoking it here is to provide a heuristic for speaking about the possibility of flexible and empowering structures in LA Unified.

At first blush, the restructuring of LA Unified into 11 local districts seems to have met several of the flexible specialization criteria admirably: division of tasks, reskilling, and cooperation. In fact, one thing that restructuring accomplished well was to create an environment that requires teamwork; previously, entire divisions of personnel were centrally located, such as facilities, but they are now more distributed with one, or several, individuals present in each local district office. This is the “knowledge worker” model of management (Drucker 1999), where individuals must be experts in their fields because they must work with others who do not, and should not have to, know the details of their specialties. Such positions may be empowering for those who want to be actively involved in

and responsible for knowledge production, communication, and management, but some individuals do not thrive under such conditions, as the following story from a local district ITAF relates:

ITAF: [The Facilities division] had over time kind of evolved a system of how to manage plants centrally. But that was with them all working together in one office and having their very bureaucratic, ritualistic ways of doing things. But now that office has been split-up and it's in 11 different areas, and most of the people have been moved to other positions, so people that were doing this in the old bureaucratic system now have other jobs or have retired because they just couldn't deal with another reorganization . . . [The facilities person assigned to our local district] was not asked to leave by the local district but chose to resign because he was having a difficult time regionalizing. He wanted to maintain his ties and his supervisory structure with the general district. And the local superintendent was saying, "I'm going to be your boss," and he said, "I resign."

While not all individuals can be expected to thrive under the pressure and responsibility of being knowledge workers, most technologists I spoke to took great pleasure in relating the esoterica of their jobs, had no qualms about confessing ignorance in other areas, and appreciated opportunities for participation that genuinely affected outcomes.

Decentralized and participatory organizations that rely heavily on information technology to facilitate knowledge production and sharing do hold a promise for increased efficiency, productivity, and worker investment (Drucker 1999; Osborne & Gaebler 1992; Reich 2000). This belief has led some scholars to proclaim that such revolutionary "informating" processes mean "dismantling the very same managerial hierarchy that once brought greatness" (Zuboff, cited in Thompson 2003). It should be evident that these optimistic projections are not realized in the current organizational form of LA Unified because of centralizing tendencies that persist in practice. Thus, the key flexible specialization criterion of decentralized decision-making authority is not met, and as a result, a cultural of cooperation and trust is not sedimented; instead, territorial conflicts pass for respectful negotiations.

There are some discernable reasons why LA Unified continues along a fragmented centralization path in spite of its efforts to reinvigorate its culture under a knowledge worker paradigm. The first reason has to do with the school district's institutional history. Just like material infrastructures, organizations like LA Unified are large tenacious entities that defy rapid change, in part because most individuals within them have grown comfortable with a culture of bounded territories and status quo operations. An ongoing history of conflict and struggle for existing territorial

demarcations – classroom autonomy, curricula development, employee salaries and duties, managerial oversight, etc. – entrenches a commitment to policing hard-won territory and a grudging respect for the status quo. These dispositions are inculcated, internalized, and reinforced with every quotidian interaction, in spite of the District's structure *du jour*.

Another reason for fragmented centralization has to do with globalization and the demands of state and industry. As the example of IT demonstrates, grant programs with outside agencies require the centralization of management, both because external funders, such as the State of California, seek to outsource the labor of distributing funds and because of the legal and procedural complexity (including liability issues) of coordinating multiple grants. Grant-givers, then, are engaged in a similar process of fragmented centralization: distributing responsibility for management and audits to other institutional bodies while maintaining authority to set the parameters of the grants awarded. The “professional” appearance of school projects, whether construction, curricula, or technological infrastructure, is a standard set by industry and, perhaps not coincidentally, can only be met by industry; this demand does not necessarily centralize, but it does remove local self-sufficiency and autonomy. Lastly, the valence of technological networks is toward central control, and the concentrated sited materiality of mainframes and their security apparatuses has been planted at central LA Unified offices. The District has become a node on the larger global network – a service provider of IT workers and consumers for the sustenance of global information flows and capital accumulation.

Is LA Unified a post-Fordist organization? My answer is yes, but not in the idealized, flexible form proffered by Piore and Sabel. It is an organization that mutates in response to changing perceptions of the role of education in society; it accepts the responsibilities given to it by funding agencies, industry, and the public; it then distributes accountability down the organizational chain while drawing control up it; it performs elaborate rituals of disclosure and responsible restructuring in answer to privatization threats; it develops many cooperative relationships with outside firms and contractors; it feeds the global economy with generous industry contracts and pliable workers and consumers. In other words, LA Unified flexibly adapts to the global political economy but does not provide a flexible environment for its workers or students.¹⁴ This current form is the paradigm for a post-Fordist organization, but it is also one

¹⁴ Another way that LA Unified adapts to changing external pressures and educational mandates is through its creative expansion of time into space in the form of year-

that prioritizes market logics over educational goals, intensifies workloads, and decreases worker participation and satisfaction.¹⁵

Conclusion

This article has tracked some organizational responses to the unique globalization pressures placed upon public institutions. Of these pressures, including demonstrating efficiency, modernity, and accountability, the call for modern technological infrastructures in public education has enabled the rise of an occupational group of IT specialists that is ushering in a post-Fordist organizational regime and disrupting historical power divisions between administrators and teachers. In some ways, IT specialists have drawn upon myths of technological imperatives and neutrality to engineer a “power vacuum” in the organization and then fill it with their own positions.

This process supports and fuels the ongoing fragmented centralization of the organization, centralizing decision-making authority and distributing accountability for centrally made decisions to actors on the periphery. In the technological arena, there are a variety of pragmatic and technical reasons for this: the complexity of managing multiple grants to ensure equity and compliance, the need to outsource labor in order to achieve networks that appear professional, and the material valence of network technologies for central siting to ease management and security operations. Certainly, there are efforts by individuals to protect and/or colonize territories (spatial, financial, decision-making, or otherwise), and

round, multi-track schools. As an example, when a school can only accommodate 2667 students but is required to serve 4000, it can split the student population into three groups, known as “tracks,” and then rotate the tracks throughout the year so that only 2 tracks are “on” at any given time. Teachers are then assigned to tracks just like students. This destroys any sense of shared vacation time for students and their families, but it does manage to expand the capacity of the school system without building more schools. Charter schools and school-university partnerships represent two other ways to contend with spatial and financial crises through the postponement strategy of outsourcing, and thereby decentralizing, responsibility.

¹⁵ “Japanization” has been a term coined by researchers of post-Fordism to account for similar mixes of flexibility, hierarchy, and rigidity in single organizations (Amin 1994; Tomaney 1994; Sabel 1994). I chose not to develop this strand of research because the qualities this term describes, especially the emphasis on work intensification rather than worker enskilling, are not uniform across LA Unified – the IT workers and many teachers in the District, for instance, are undergoing a process of enskilling *and* work intensification, but it would be inaccurate to categorize all these individuals as managers.

these efforts can propel fragmented centralization, but the primary forces behind structural changes are institutional, economic, and technological.

I contend that fragmented centralization is the post-Fordist organizational form *par excellence* for adapting to external pressures, interdependencies, and vicissitudes. Unfortunately, it is also a form that intensifies workloads for most employees, decreases participation and commitment levels, and binds individual autonomy and innovation in a straight-jacket of imposed standards, contracts, laws, curricula, software, and infrastructures. In short, fragmented centralization is an organizational form that does not serve educational missions well because it obstructs the production and distribution of knowledge across networks; it flexibly adapts to capitalism's mutations but does not extend that flexibility to the people who comprise the organization.

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