

Constructing Specialized Knowledge: Through Activity Coordination During Organizational Change

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Prior research has established that sharing knowledge across interrelated organizational systems is challenging and complex. This is especially the case when organizational change initiatives require changes in how those systems relate to each other. This project was an investigation of knowledge processes between interrelated activity systems in a large facilities management organization as a change initiative was implemented. Interviews with 27 employees representing nine organizational activity systems were the primary source of data, with field notes used to enrich interpretations in this qualitative study. Results were interpreted using constructs from structuring activity theory. Participants communicatively constructed cultures of exclusivity in their activity systems, creating boundaries that made knowledge sharing and activity coordination difficult. The change initiative was aimed at creating a culture of inclusivity, which was undermined by perceptions that the management activity system engaged in more exclusivity-creating practices than other activity systems. Several contradictions were explicated pertaining to inclusivity and exclusivity. Tensions persist in how systems coordinate around and with conflicting objectives and activities. The discussion offers theoretical contributions of the analysis and suggestions for using results to improve organizational practices.

Key words: organizational knowledge; structuring activity theory; activity coordination

1. INTRODUCTION

Much of the existing scholarly literature on organizational change can be categorized under one or more of several themes (Lewis, 2011). Studies generally focus on implementers' strategies, recipients' responses, or "successful implementation" –meaning that implementers accomplish their personal goals. Change is not always productive; it can be destructive, or part of a learning process. As members interpret, talk about, and adjust to change mandates, they construct social affiliations and divisions regarding who they are, with whom they work, what their work entails, and how they will adjust. These boundaries between groups may be visible, invisible, or blurred (Lewis, 2011).

This project focuses on communicative interaction between work groups during a management-initiated strategic plan implementation in a facilities management department within a large public university system. The purpose of the strategic plan is to reorganize functions of work groups to enhance collaboration. Knowledge construction and sharing through collaborative activity coordination are important concepts in this change process. It is helpful to consider a work group in this context as a community that shares an activity around which members coordinate knowledge, ideas, and actions.

Structurating activity theory (SAT; Canary, 2010b), a recently developed integration of Giddens' (1984) structuration theory and Engström's (1999) articulation of Cultural-Historical Activity Theory (CHAT), frames analysis of this complex process. The SAT analysis teases out both the subtle and defining elements of communicative activity in a collective of people, rules, resources, and outcomes across space and time.

This project addresses two major issues identified in prior scholarship. First, scholars call for theory that includes reciprocally influential relationships as they are used to analyze innovation in organizations (Coopey, Keegan, and Elmer, 1998). Second, recent organizational knowledge theory and research demonstrates that the communicative process of how knowledge is constructed across organizational systems is in need of further empirical investigations to build theory in this domain (Canary, 2010a; Kastberg, 2014). Findings from this study address these challenges by clarifying the current SAT model, and supplementing it with an additional model of nested knowledge construction during change processes. Specifically, our research questions are directed toward understanding the complexities of communication during change implementation, including knowledge construction, knowledge sharing, and activity coordination. We pose this set of research questions:

- RQ1: How is activity coordination communicatively enabled and constrained between activity systems during an organizational change process?
- RQ2: How is knowledge communicatively constructed between activity systems during an organizational change process?
- RQ3: How is knowledge sharing enabled and constrained between activity systems during an organizational change process?

We discuss the theoretical framework for the project before briefly reviewing relevant literature concerning organizational knowledge and change. We then report study methods and results. The final section proposes theoretical and practical implications of the project with suggestions for future research.

2. THEORETICAL FOUNDATIONS

Understanding organizational change processes requires a complex theoretical frame, especially if a strategic implementation extends across time, space, and organizational structure. We adopt the communicative constitution of organizations (CCO) perspective as an ontological framework for the role of communication in organizational knowledge processes. Because this perspective on organizations is relatively new, we describe major constructs from one stream of CCO that guided our analysis. We also briefly describe the major constructs of SAT that are relevant to the current project.

2.1. Conceiving the Organization

An organization can be considered a relatively stable “system with boundaries” (Schoeneborn, Blaschke, Cooren, McPhee, Seidl, and Taylor, 2014: 294) that self-structures through intricate and sustained operations of human communication. McPhee and Zaug (2000) argue that organizational operations entail a complex cycle of broad communication flows, or ongoing activities. Intent to communicate is not necessary for an organization to emerge, but a stable system of relationships is required, evident through recursive interplay between organizational self-structuring and agentic action (Giddens, 1984).

The CCO perspective holds that complex processes of communication must be sufficiently linked in an indeterminate, dynamic form. Order ensues from subtle, as well as from substantive events (Weick, Sutcliffe, and Obstfeld, 2005). Organization emerges when group communication perpetuates itself through time in inter-locking events (Schoeneborn et al., 2014). McPhee and Zaug identified four fundamental flows of communication that characterize an organization: membership negotiation, self-structuring, activity coordination, and institutional positioning. Activity coordination and membership negotiation concern how communication spurs interaction within and between systems, and who is involved in participation (McPhee and Zaug, 2000). Self-structuring and institutional positioning indicate structural influences outside fluid borders which construct how the organization differentiates itself from others, which is largely determined by its goals.

2.2. Structuring Activity Theory

Organizations usually contain a wide range of interrelated activity systems (Canary et al., 2013). Activity systems depend on communication to bring about their overarching purpose, which is to produce action (Canary and McPhee, 2009). The activity system construct orients us to organizational aspects impacting/impacted in a change process – community, division of labor, rules, and mediating resources – as the system orients toward an object and an eventual outcome. A community in an

activity system is similar to a “community of practice,” to the extent that each term primarily concerns a group of people working toward a common interest or goal (Wenger, 1998). Division of labor includes the hierarchical and horizontal features of formal organizational structure and pertains to how tasks are delegated (Canary and McPhee, 2009). The rules of an activity system relate to system-specific ways activity is carried out. The subject is the analytic point of view from which to perceive the object. The object is the collectively negotiated goal or orientation of the system. Finally, the outcome is what results from the system’s activity.

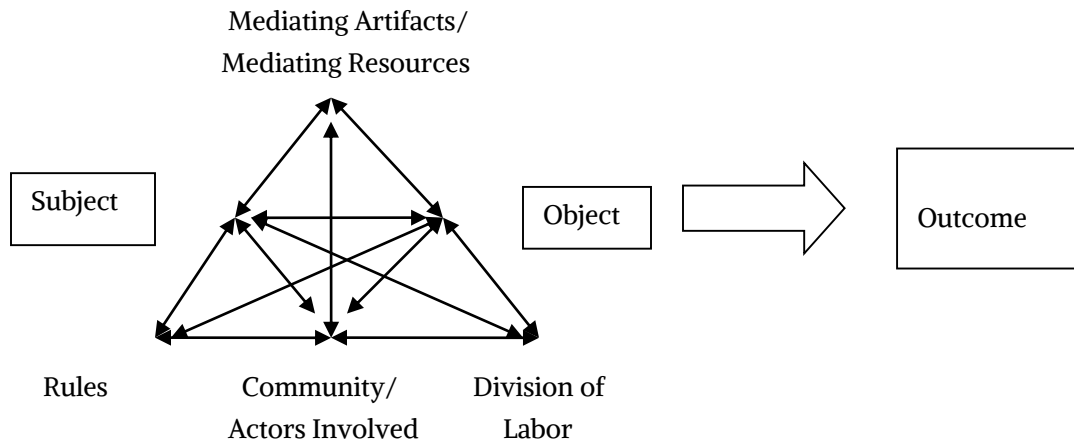


Figure 1. The Activity System

Source: Canary, H. E., and McPhee, R. D. (2009).: 153.

No element of an activity system affects the outcome of activity in isolation (Canary, 2010b). The system functions holistically. One of the activity systems in the current project, Construction Project Delivery, provides an example of how system elements connect for overall activity accomplishment. One participant providing his perspective of the system in the interview process is a *subject* of the system, who is also part of the *community* of all members of the activity system for the organization. Members of the system use tools such as saws and measuring tapes to accomplish their construction activity (*material mediating resources*), while they also use specialized language and acronyms reflecting their trade (*symbolic mediating resources*) to work together. They follow particular *rules*, not only of the broader organization, but of their particular system, for how construction projects are accomplished by these people with these resources in this organization. One element, *division of labor*, was quite clearly presented in this project in interview comments about who has authority to allocate work projects (*hierarchical division of labor*) and who is responsible for accomplishing various aspects of their overall activity (*functional division of labor*).

Using an activity system as the unit of analysis avails crucial interdependent phenomena for observation, including communication practices that can, for example, differentiate between success and failure for a community (Engström, 1999). SAT is outlined in the following six propositions:

1. Knowledge construction is situated within particular social contexts, with social structure enabling and constraining the knowledge construction process.
2. Elements of systems of ongoing activity mediate situated action and interaction, such that system elements shape how and what knowledge is constructed within and between activity systems.
3. Mediated activity draws on social structure as it also reproduces and transforms structure over time through system transformations.
4. Contradictions are generative mechanisms for the communicative construction of knowledge as individuals interact to resolve contradictions in the process.
5. Knowledge constructed between systems is mediated by elements of intersecting activity systems.
6. The construction of knowledge between intersecting activity systems is constrained and enabled by structural features, while at the same time constructed knowledge produces, reproduces, or transforms social structure.

(Canary, 2010b: 31, 34, 36, 37)

These propositions reflect both structuration theory constructs and CHAT constructs. Bringing broad structural-level constructs of structuration theory into conversation with system-level constructs of CHAT in SAT propositions addresses limitations of each of those foundational theories. On the one hand, mediating elements provide more concrete ways for analysts to articulate structuration processes. On the other hand, structuration processes provide broader implications for system-level activity. Additionally, SAT represents a CCO perspective in organizing by highlighting the processual characteristics of accomplishing activity that structure both activity and the collectivity of people, resources, and actions. That is, SAT-based analysis focuses on the communicative nature of organizing through mediated and structuring activity.

Although SAT was developed to explain the communicative construction of policy knowledge, propositions of SAT also can be applied to the current change context. SAT is appropriate for understanding knowledge processes in organizational change for several reasons: (1) strategic plans enable and constrain a number of organizational processes, (2) changes span intra-organizational boundaries, and (3) organizational change initiatives are discursive in nature. Making sense of interacting systems implies that activity systems influence each other in concrete ways, simultaneously enabling and constraining the boundaries that are set. Regardless of who thinks they are in control of the plan implementation, actors gain knowledge through activity, and consequentially utilize gained knowledge in a continuous and recursive pattern of communicating joint and individual learning (Canary 2010b).

One of the main constructs of SAT is *contradiction*. Contradictions are organic in communicative activity, and are observable in communicative organizing. Primary contradictions ensue inherently within an activity system. Although they do not always transform system structure, they always

derive from it. Secondary contradictions appear when new elements are introduced to the existing system (Canary, 2010a). Tertiary contradictions emerge when a new object is introduced as the focus of activity. Quaternary contradictions exist when accomplishing the central activity of one system prevents accomplishing the activity of another system. In all cases, contradictions can facilitate new forms of activity and reshape a system in subtle or dramatic ways.

Scholars agree that structuration-based theories offer promising approaches for studying emergent systems of communication and interactive, continuous group processes (Scott and Myers, 2010; Whitbred et al., 2011). SAT is a suitable synthesis for analyzing emergence and interactivity in organizational change. SAT's wide applicability is not limited to policy contexts alone. Consider Canary's (2010b) definition of policy: "Dynamic processes that include texts, practices, and decisions that organize action across contexts" (p. 24). Although the situation in the current study qualifies as a *policy* by Canary's definition, it should be considered broadly as a strategic plan. The term more accurately reflects the nature of a change process, which Zorn et al. (1999) define as, "any alteration or modification of organizational structures or processes" (p. 10). As definitions of policy and change are complementary, so is SAT to the organizational context in question. As Canary and McPhee (2009) stated, "Examining communication within and between activity systems can identify knowledge resources as well as communicative strategies" (p. 152). This study extends SAT by demonstrating its relevance for organizational change contexts.

The current project involves skilled project teams, whose knowledge construction, sharing, and activity coordination is nearly always mediated – whether by technology, language, rules, divisions of labor, or other systems (Boer, 2005). Because tensions pervade how teams experience the change process under investigation, a model that foregrounds that tension is the ideal choice for analysis. Systems conceptually keep individuals and structures intertwined in activity (Engström, 1999), which elicits the diverse forms of tension, which might arise in or between any element(s) in a system, or even between systems. Specifically, evolving coordination in organizations is likely to result in elusive object orientation and unpredictable results (Blackler et al., 2000). Indeed, "the components of an activity system and their mutual relations are neither static nor harmonious but are characterized by ambiguity and change" (Boer et al., 2002: 9).

More pertinent to this study, though, and inherent to activity systems, is how divisions of labor are communicated. As mentioned earlier, divisions include horizontal and vertical forms of hierarchy to accomplish work. Divisions exist as social boundaries arising out of power and task structures, and are difficult to grasp without the idea that they are communicatively constituted (Canary and McPhee, 2009).

As labor is distributed across divisions within a large organization, agents must engage with intersecting work and personal identities, and by so doing usually reproduce institutionalized power structures as they negotiate their membership (Boogaard and Roggeband, 2010; Scott and Myers,

2010). The formal culture established (mostly) by those in power may define knowledge, how it should be shared, and even who can share it (De Long and Fahey, 2000). Distinct and varying systems might organically or intentionally emerge from conditions such as these. Professional identity formation demands that a group differentiates itself from other groups – or establishes symbolic social boundaries to define itself in comparison to other teams. Unseen boundaries formed through activity divide knowledgeable systems from one another (Duguid, 2005).

Overall, divisions of practice imply divisions of knowledge (Brown and Duguid, 2001). Fairhurst and Connaughton (2014) call attention to leaders' need to understand the discursive basis of knowledge. Divisions of knowledge arise between managers and subordinates, coworkers, and work teams in knowledge construction and sharing during activity coordination.

3. ORGANIZATIONAL KNOWLEDGE, COORDINATION, AND CHANGE

The SAT perspective allows for a multi-dimensional view of organizational knowledge, paving way for a nuanced explanation for how knowledge is communicatively constructed between activity systems during change. Boer (2005) claims knowledge is “collective understanding plus the ability to transform this understanding into actions” (p. 21). This includes a number of types of knowledge and domains, including commonsense incorporation of “social practices followed in given settings, used in particular social relationships, and influenced by institutional settings” (Haslett, 2013: 617). Knowledge contains interdependent dimensions, such as being embedded in a community, being dynamic, and having both tacit and explicit aspects (Boer, 2005; Canary 2010b; Wenger et al., 2002).

Knowledge can be a source of innovation or constraint, argue Hargadon and Fanelli (2002), depending on whether knowledge is action or possibility. “Every experience implies a potential redefinition of preexisting schemata, whether the actor is capable of putting such an expedience into words or not” (p. 295). With the immense power of possibility, knowledge can also undo hierarchical, structural domination (McWilliam et al., 2008). Despite such a wide range of conception, Canary and McPhee (2011) believe that we should be primarily dedicated to eliciting systemic connections regarding knowledge dimensions. They further stress that knowledge construction and sharing are inextricably connected to power and organizational politics. This study marries these concepts more concretely by observing knowledge sharing constraints and enablement during real power-laden and immensely political organizational shifts.

Many knowledge management practitioners seek to develop ‘best practices’ for knowledge management and dissemination. For example, Cabrera and Cabrera (2005) explicated a key people management practice in designing work that encourages collaboration among employees. Bresnen et al.'s (2005) construction management study revealed that when new knowledge and existing practice align, better project design and management ensue. Choo (1998) advocates for the “knowing

organization,” similar to the “learning organization,” but is primarily committed to utilizing member knowledge and beliefs to incite organizational actions, rather than reserving major decisions for top managers only. A common feature of much of the organizational knowledge literature is that knowledge construction and activity coordination are correlated constructs.

3.1. Coordination in Activity Systems

When seeking to address how inter-system activity coordination communicatively enables and constrains organizational members during a change process, one must begin with the premise that some communities are more collaborative than others, a feature of activity coordination. The idea of units within organizations as communities or sub-groups is not new, neither is the idea that divisions may transform over space and time through willingness to share (Hannan and Freeman, 1989). Sharing/collaborating requires certain inclinations toward relationships (Boer et al., 2011). When diagnosing whether a system effectively uses its knowledge, a team would want to figure out the “big picture needs and vision” of each affected division (Roper et al., 2009:11).

SAT recognizes that social orders create “discursive spaces where things can neither change or stay the same without the active work of communication in everyday life” (Heller, 2007: 652). If a strategic plan is to be effective, it must be accompanied by strong investment on the part of all members, a collective interest, and willingness to grow and share knowledge through collaboration. These activities are not possible without implementers being aware at all times what their activities and practices do to structure differentiation and/or hierarchies among interrelated work groups (Ortlieb and Sieben, 2014).

Boundaries between activity systems are not necessarily impermeable, especially among intra-organizational systems. Conceptual communities can overlap through multiple reciprocal relations (Löw, 2008). Inclusion and exclusion connect simultaneously in the same social space via institutional ordering. How individuals position themselves and others along lines of belonging depends in large part on the product of reflexive spatial and temporal activity production (Löw, 2008). Thus, space can be described both in material geographical terms and also in social terms.

A system’s ability to foster an inclusive environment is crucial to successfully implementing processes that encourage systemic knowledge sharing. Organizations are finding that members are reluctant to exchange knowledge with closely connected systems, and that this hesitancy may be caused by the organization’s poor approach to knowledge facilitation (Wasko and Faraj, 2000). Sveiby and Simons (2002) observed that collaborative climate directly impacts knowledge construction.

3.2. Communicating Organizational Change

Suppressive tendencies, such as hierarchically invoked alliances or being closed to sharing, inhibit natural collaboration that arises from belonging to a community (Ropes, 2009). Understanding how a

community forms organically means taking an empirical look at how ongoing communication constitutes an organization (Kuhn, 2012). Activity systems are an integral feature of organizational change processes, especially when the change concerns formal and informal community membership across divisions.

Although practitioners might view strategy planning as linear and fixed along a pre-established path, Jarzabkowski (2008) argues that strategy is socially dynamic, and should be treated so by researchers. In a seven-year longitudinal qualitative analysis of top managers across three universities, Jarzabkowski found that strategy takes shape gradually, the success of which depends on several factors, including whether or not the school was strongly or weakly institutionalized. Her finding coincides with Kuhn's (2012), that a manager cannot escape being reflexively and continuously molded as they put their plans into action.

Organizational processes are inherently complex. This is certainly the case when, in any given scenario, as many as hundreds of stakeholders with diverse agendas might debate over various considerations. At times, the inclusion of competing egos, funding, values, and possible coercion culminate to make for "sticky" knowledge processes (Brown and Duguid, 2001). In particular, Kodeih and Greenwood (2014) note that "organizational responses are shaped not by current identities, but by *identity aspirations*" (p. 34). This implies the complex and central role that members' objectives play in knowledge change, and in activity coordination in general, as implied by the SAT model.

Executing a strategic change effort impacts relationships among group divisions within a large collective. These interdependent relationships are founded and maintained on communicative processes, which are understood through the CCO framework. Groups are important to consider as possessing substantive research value, because they represent a vital site of learning and sharing. Canary's (2010b) view of organizations as "collections of intersecting and related activity systems" (p. 45) can be thought of as complementary to the definition of organization presented earlier.

4. METHOD

This study is part of a larger longitudinal project which observed communication processes within and between many divisions in a large facilities management (FM) organization during a one year period of management-initiated strategic change implementation. The principal investigator took the role of interviewer, employee, consultant, advocate and liaison as relationships were forged with management and front-line employees. Only methods, data, and results concerning between-system knowledge and coordination are included in this report. The appropriate Institutional Review Board approved the project. To protect confidentiality of all participants, pseudonyms are used to refer to the organization and participants.

4.1. Research Context

FM is a large independently-functioning organizational unit within a large public university. FM is involved in every aspect of campus facilities functionality, including building planning and construction, custodial services, landscaping, utilities installation and service, and many other trades-related functions involved in building and maintaining university buildings and grounds. FM prides itself on being part of the university. It is housed on campus, where employees regularly interact with and serve students, faculty, and staff. The FM strategic plan concerns improving workers' willingness and abilities to be precise and innovative in accomplishing projects together, with the ultimate goal of improving customer satisfaction.

4.2. Participants

Participants represented every major area within FM. Table 1 presents the FM Activity Systems in this project and the number of people within each activity system who participated in this project.

<i>Activity System</i>	<i>Number of Project Participants</i>
Management	5
Business Services	1
Campus Planning	1
Construction Project Delivery	1
Campus Support	7
Campus Utility Services	4
Facilities Operations	4
Central Services	3
Workplace Services	1

Table 1. FM Activity Systems

All but one of the participants shared their demographic information. Six participants were female, and the other 20 were male, with one participant declining to disclose their biological sex. Ten participants have been employed with the organization for 1-5 years, five participants have been employed with FM for 6-10 years, one individual has been with the organization for 11-15 years, three participants have been employed there for 16-25 years, five individuals have been employed with FM for 26-35 years, and two have been employed for 36 or more years, with one participant declining to disclose their tenure at FM. One participant is between 18-30 years old, seven are ages 31-40, four are ages 41-50, eleven are from ages 51-60, three are ages 61 or over, and one participant declined to disclose their age. In terms of ethnicity or race, 25 of the participants identified as Caucasian/Non-Hispanic, one identified as Hispanic, and one chose not to disclose their ethnicity. Six participants hold high school diplomas, six have attended some college, six earned associate's degrees, six earned

bachelor's degrees, eight earned graduate degrees, and one chose not to provide education information.

4.3. Data Collection

The lead author functioned as a participant-observer (Lindlof and Taylor, 2002), working as a paid “collaboration consultant” for the change initiative while in the process of collecting data. Participants were invited to join the project with emails requesting confidential interviews. Interviews were audio recorded and lasted an average of 45 minutes per participant. As the collaboration consultant, the lead author kept a research journal of experiences and thoughts as he coordinated with other members of the organization. He also recorded strategic plan workshop sessions, during which he trained workers and solicited feedback pertaining to their experienced challenges, concerns, and suggestions for improvement.

The lead author spent a total of one year in the organization, ten months of which were spent preparing, executing, gathering data from, and reporting on workshops. He spent on average three days per week, totalling approximately 12 hours per week. Interviews were conducted during seven of the twelve months. Field notes drawn from the research journal served as a supplementary ethnographic account to assist in interpreting data from interviews. Audio recordings of the workshops and notes taken during the workshops also served to enrich data analysis and interpretation. These multiple methods of data collection and multiple sources of data constitute accepted practices for the organizational ethnography methodology (Tracy, 2013).

4.4. Data Analysis

Interview transcripts were uploaded to NVivo 10.0 qualitative data analysis software. We took an iterative approach to data analysis (Tracy, 2013), meaning we alternated between meanings emerging from multiple readings of the data and theory-informed meanings we interpreted from the data. Throughout coding, we used the constant comparative method (Tracy, 2013), comparing new codes to other codes, modifying codes to better fit the data, and eventually creating categories that were both grounded in the data and informed by the SAT framework. First-level coding (Tracy, 2013) resulted in over 700 initial codes and only one higher-level conceptual category. We began introducing SAT constructs into the coding process to identify communicative processes of enablement and constraint, merging and constructing codes as we fleshed through the entire coding scheme four or more times.

We noticed that categories not directly related to system coordination were highly relevant to elements in the activity systems, so we coded them together as *Coordinating Elements*. Soon after we noticed that every comment related to knowledge referenced specific kinds of coordination, and they also pertained directly to knowledge construction rather than knowledge sharing.

We thereafter decreased the number of codes and categories by merging, dissolving, and recoding. Interpretation was informed by memos and annotations made during the coding process which related to contradictions and various types of communication utilized by members of the organization. Results reported below reflect analysis of codes, themes, notes, and memos.

5. RESULTS

Table 2 presents the final code structure concerning between-system knowledge and activity coordination.

<i>Theoretical Themes</i>	<i>Theoretical Categories*</i>	<i>Codes</i>	<i># Ref.</i>
Between-System Coordination in General	Constructing knowledge		252
		Constructing other shops	60
		Constructing our reputation	5
		Constructing who we are together	55
	Exclusivity		61
		Avoiding	22
		Cliquing	16
		Conflicting	16
		Lacking time	7
	Inclusivity		71
		Coordination is good	16
		Networking	33
		Sharing	13
		Utilizing strategies	9
Between-System Coordination -Management	Constructing knowledge		384
		Constructing management	154
		Constructing who we are with mgt	85
		Constructing workers	30
	Exclusivity		39
			181
		Avoiding	30
		Control	54
		Misaligning	30
		Opportunity scarcity	18
		Undervaluing employees	24
		Using AiM	25
	Inclusivity		49
		AiM focuses efficiency	9
		Empathize	12
		Involve	8
		Problem-solving strategies	14
		Provide resources	6
Coordinating Elements			751
	Object		80

		Change	34
		Collaboration	15
		Stability	31
	Outcomes		79
		Change	17
		Decreased effectiveness	18
		Fulfill mission	12
		Org advancement	6
		Unification	20
		Valuation	6
	Social structure		290
		FM	211
		Institutional	58
		Societal	21
	Subject		302
		Constructing myself	88
		Exclusivity	17
		Inclusivity	30
		Personal opinions and values	127

Table 2. Data Themes, Categories, and Codes

** Note: References for "Theoretical Categories" are aggregates of the Constitutive Codes*

We approached data analysis with all three research questions concerning activity coordination, knowledge construction, and knowledge sharing in mind. However, data indicated those three processes are not entirely distinct; rather, they are more inter-related than we originally assumed. When we initially introduced the theoretical framework to the coding process, we distinguished knowledge sharing from other conceptual areas. As we continued a very close reading of responses, combining references in categories as we went, we noticed that knowledge-oriented references primarily concerned knowledge construction. We then integrated knowledge construction and sharing. In other words, data indicated that for these participants, knowledge sharing is contained within knowledge construction processes, which in turn mutually impacts overall activity coordination. The three processes are in a nested relationship, with activity coordination representing the broadest process that is influenced by knowledge construction processes, which inherently include knowledge sharing behaviors. See Figure 2 below for a visual representation of the Nested Model.

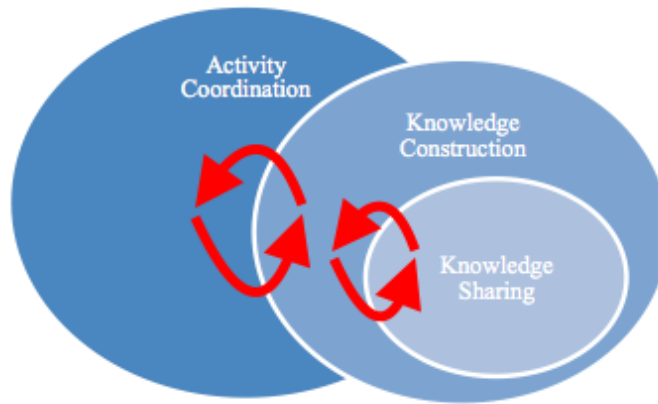


Figure 2. Nested Model of Knowledge and Activity Coordination

This model was articulated by participants as they talked through different ways they share knowledge across activity systems, how that sharing becomes part of an ongoing process of organizational knowledge construction, and then how that knowledge is an integral part of coordinating activity across systems. Sharing is part and parcel with construction processes as exchanges are both facilitated by existing knowledge and facilitate the construction of new knowledge. Activity coordination encompasses a wide range of communicative behaviors across systems. Coordination not categorized as knowledge construction dealt with labor and organization (e.g., job completion or resource utilization).

The Nested Model provides the structure for addressing the Research Questions in the remainder of this section. As such, we discuss results concerning the broadest process first, Activity Coordination. Then we discuss results concerning Knowledge Construction and include references to Knowledge Sharing in those results. In the Discussion we elaborate on the theoretical and practical implications of the Nested Model.

5.1. Activity Coordination

Themes within activity coordination differ from knowledge-related data analytically in addressing how mediating resources and rules influence action in terms of agency. Data in this theme address RQ1: How is activity coordination communicatively enabled and constrained between activity systems during an organizational change process? Participants made a distinction between trade-based activity systems and management (see Table 1 for list of participating activity systems). Accordingly, we coded references to coordination with the management activity system separately from coordination among other activity systems. Through analysis, the sub-themes of “inclusivity” and “exclusivity” emerged as interpretive categories for how participants explained their activity coordination (see Table 2).

5.1.1. Between-System Coordination in General

This category represents all references related to coordination that occurs across system boundaries in FM. This is to be distinguished from between-system coordination related to management, as comments qualifying for this category were considered not to be addressing leadership in any way.

Inclusivity. This category includes references to cross-system coordination aimed at benefitting more than just one system. Because this was the focus of the change initiative, many participants referenced topics in this category. Workers network with other systems by fostering relationships, asking a favor, or to accomplish a shared task. Participants feel that adept communication characterizes relationships across system boundaries. Members from various communities share resources and utilize strategies for successful interaction with others. Brandi explained:

Um, I think that a lot of crew leaders are contacting people out in individual shops. I think that's happening probably more than we know. But I think part of what's a useful part of the communication is having that individual and personal relationship as long as it's something offered to all. But it's just, "So and so, oh Randy, he's nice to me so he'll come up and help me."

Exclusivity. This is cross-system coordination that does not benefit extra-system goals. Although not referenced as much as inclusivity, participants clearly indicated that an exclusive culture pervades FM. For instance, Carlton noted:

I think a lot of people like to take ownership. They get very protective of what they take ownership over and that can cause conflict. I think that's one of our biggest worries. People want, "This is my area, don't mess with that area."

Workers are inclined to avoid others, especially when confronting or coordinating with other systems is not in one's own or one's system interests. Cliqing occurs, which establishes clear social boundaries, facilitating conflict with those outside. Some lament that they simply lack the time needed to form important relationships with other experts, but many blame poor interaction on previous mishaps:

"And so I think sometimes people on the [other] side try to avoid interaction with maintenance just because they've had so many unpleasant experiences" (Oliver).

5.1.2. Between-System Coordination – Management

This area is dedicated to those responses that addressed how management interacts with those outside their immediate community, in essence their relations with systems in the organization considered any type beside management. The following comment illustrates that this theme is dominated by tension and conflict:

“He did an excellent job and yet a supervisor who does not support us ripped his employee for going up and beyond what his normal routine would be and you know, it just hit me wrong.” (Frank)

Exclusivity. Management was tagged most as being highly exclusive in terms of cross-system coordination. Many different strategies were highlighted, which together create a full spectrum of activities ulterior to supposed or pretended engagement with different sectors. Control was most prominent among them, which included efforts to dictate jobs and tasks. Participants believe management too often belittles those who are not in management. They also protect personal interests in an effort to maintain power.

“Where with upper management it’s more like they’re doing the switch and be on board, here we go. There’s really no discussion with us when it happens” (Carlton).

They have also been observed by employees avoiding important relational opportunities, showing apathy toward others, concealing important information, and failing to share accountability to group outcomes.

Misalignment occurs as management balks on participatory decision-making processes, effective work ordering, and reporting. A few current conditions are not meeting expectations, especially regarding how employees are able to utilize the organization’s information management and distribution technology, called AiM. This system suppresses worker agency, as they are not able to tap certain capabilities and features that are not added to shop work order processes. Lack of communication and implementation at the administrative level contribute to the milieu of challenges arising out of lack of follow-through and purposeful updating.

“And so you just get people, all they do is bash the system therefore you can’t really get anything accomplished because it just doesn’t work. But nobody’s come back to say what we want it to do to get what you want out of it. So yeah it’s doing the bare minimal to get by” (Veronica).

Managers are also viewed as undervaluing employees in a manner which de-legitimizes their unique contribution and personhood, as well as their knowledge and capabilities in their particular assignments. Participants believe management deliberately prevents others from achieving through opportunity scarcity, which prevails over those who are not in advanced positions. Many perceive they are subjected to a career advancement, innovation, and/or efficiency stalemate.

Inclusivity. Participants did not reference inclusivity for management very much, demonstrating a preoccupation with and possibly increased presence of exclusionary activity between management and front-line workers. However, marginally compensatory activities include problem-solving strategies management practices to alleviate organization-wide issues.

“I think that’s probably why they allowed you to do this. Let’s face it, they put a lot of money and manpower into your seminars, because they want to fix it” (Adam).

Managers do empathize with others in a manner that builds a sense of team or family. In many ways AiM – primarily a management tool to track productivity – enables workers to focus on and achieve labor efficiency. Managers also involve others and provide needed resources in certain contexts.

5.1.3. Coordinating Elements

Participants made comments regarding system elements that mediate activity during coordination and knowledge construction. Codes in this broad category relate to how structures of meaning, authority, and legitimation facilitate and are reshaped by activity and knowledge construction. Specifically, codes of this kind provide reflexive insight regarding how extra-system elements such as institutional structures guide ongoing activity and how mediating elements such as objects structure future coordination. Comments referenced coordination in the past, present circumstances, and future orientation to explain how activity in the organization is mediated by various forces.

Subject. Reflections of subject-level considerations ranged anywhere from work-related intrapersonal processes to robust philosophies of labor. Subject-level commentary aligns with insights shared regarding system and organizational levels. Participants had a plethora of opinions and projections to forward pertaining to nearly every aspect of formal structure. Subject concerns add richness and explanatory power to system collaboration when linked to comments concerning within and between system coordination.

Inclusivity. Input grouped within this theme demonstrated efforts to aid in the effort of the organization rather than have a self-absorbed approach. Individuals contribute to the mission of FM by taking personal initiative on the job. They seek to learn new knowledge about their trade. They respect others, including coworkers, management, and customers. Workers also contribute to the whole by showing resilience in spite of opposition.

Exclusivity. These are strategies participants noted they use to serve self-interest rather than a commitment to a communal or collective mindset. Strategies included distancing oneself – either socially or physically – from others and convenience. Convenience implies workers’ tendencies to alleviate the stress or demands of the organization, as Adam shared:

I’m going to tell them exactly what they want to hear until the day I leave, because I’ve got a family I’ve got stuff so I just keep on keeping on. And what I do is essentially I think I’m an optimist, I’m going to make the best of it. I find some way to buy myself off so I can just finish out my time.

Social structure. Participants perceive that they are constrained and enabled by various types of structure, both immediate and indirect. They cited institutional policies, departmental culture, and societal norms among other diverse rules and resources as structuring their time and responsibilities. They referred to the past, present, and future in terms of comparing their organization to others, or to their own collective potential.

Facilities and Construction Operations. At the organizational level of focus, present and future tenses were drawn on to describe what the work environment is like and how participants believe it needs to improve. Futuristic concerns received the most references, which were presented as potential structure. Suggestions for advancing the organization's function and mission included a call for more direct communication channels between management and shops and better training opportunities (including new modules or programs) for newcomers and seasoned employees. Participants want to see increased capacities on the front line by hiring more skilled workers and more managerial investment in employee and daily task needs. Participants hope relational tension can be alleviated by improving perceived respect from managers toward workers. Additional propositions included process assessments, increased worker proactivity, a united workforce, and more resources. These are viewed as holistic new approaches, rather than just benefitting one segment of the organization.

In terms of enculturation, rich labels were used to describe the current culture. Participants experience the organizational culture in the following ways: as a hierarchy, both a positive environment and negative environment, kingdoms, and emphasizing money's importance. Lane asserted, "Are they willing to get together? I think in Lean they call it silos, people create their own kingdoms, and you don't belong in my kingdom, stay out that sort of thing." Current structures include scarcities of opportunities or resources and acknowledgement that work is highly demanding. Boundaries between systems are protected and contested, and quite rigid to an extent.

Institutional. Devaluing employees is a campus-wide problem, and is not confined solely to FM. This norm structures devaluation at lower levels from supervisors to front-liners. At the institutional level, rules change in diverse ways. For instance, entitlement rather than policy fuels demands from stakeholders across campus when calling FM to complete projects. Big picture concerns haunt visionaries in higher administration, who react by empowering upper-management, who instigate reactions to big picture change needs. Competition is fostered by management by increasing numbers of outside vendors and contractors for university building and maintenance. At times, strong buy-in and alignment to the university's mission can be noted across disciplines and staff:

I've worked with a lot of guys, in particular when I was doing welding that were just like, 'There's just no way we can do this, this is impossible, why are they putting this kind of pressure on us, why are they asking us to do this?' And I think that the work load here is greater than what we were going through there, but I don't see that same sort of, 'Oh gosh, why me?' same kind of thing, which is good. (Tyrone)

Societal. This most abstract level relates to observations of coordination that take place outside the university campus in industry and the public sphere. Many compared public employment to private industry:

I think everything takes longer than it should. And this is kinda a digression on my part but I think it's part of kinda government-type work, not you know, we're not chasing a profit. You go into a company...if we were trying to make a profit, three fourths of the things we're doing we wouldn't be doing. We do a lot of stuff here because we're a public institution -a bureaucracy. So a lot of tasks, a lot of work load gets added. And because we're a bureaucracy too, I think we're under paid, under staffed. (Jack)

Many concluded that the grass is not greener in other companies or schools for their chosen vocation. They realize that their organization, and government employment in general, is not unique in that immense and increasing pressure is put on workers across industries in society.

Object. Members across systems and positions had much to offer in the area of objects, which facilitate action by orienting systems toward agreed upon goals and motivations. Objects catalyze activity generation in this organization. No shortage of ambition for the future can be surmised as interviewees grappled with prospects of change/stability and cooperation to reduce unproductive insulated independence. Wide-ranging variations of goals and motivations were presented. Objects of some at FM are in tension with others, particularly when the management activity system is compared to others. Never was an argument made against the potential benefit of collaboration between and within systems, although other forms of goals were focused on much more.

Change. Most members strive toward change-oriented goals that increase productivity and/or unite employees in personal achievement. However, many comments concerned how change efforts have resulted in mass misalignment. This may be due to the emphasis put on entrepreneurial and *Lean* manufacturing (efficiency) approaches compared to what many view as a maintenance mission. Explaining why they believe the organization is adopting an entrepreneurial approach, Diane reasoned:

... for somebody to say, I don't know if it's a power thing. Maybe, 'This is what I've done, this is what I've created.' So whether he - this person - if they stay here or they move on, it's like, 'You know what, I've changed the whole facilities.'

Stability. A push for consistency characterizes polar opposition to change. In contrast to hopes for a waste free, business savvy company, many participants found that staying committed to values, maintaining campus, offering quality customer service, aligning processes and people, and becoming more collaborative are fundamental for defining success at FM:

Well my purpose here, if I look at it the way other people in other shops look at it as, I think facility operations, our goal is to manage these buildings and keep everything running so we can run the best facilities to have the best university that we can. That's the attitude that I have and that's what we're supposed to accomplish. (Dallin)

Outcomes. Desired effects were proposed and/or recalled concerning how the organization is to progress through time and space. According to participants, expected or experienced results are supposed to impact relationships and functions, as well as culture. Unification was proposed as an ideal anticipated outcome to increasing collaboration across systems:

The relationships you build, and that sense of camaraderie or I don't know I think that would be a powerful thing. Cuz other people would get to know the supervisor and he would get to know his workers and they'd get to see the human face... But that seems like a good way to reduce that alienation between. (Aaron)

However, many participants noted many instances of decreased effectiveness between groups. Change is apparently viewed not only as an object and a process, but an everyday reality that must be navigated. Members desire to see the organization advance and develop, but this is an area comprising both the present and the future, positive and negative valences. Fulfilling the organization's mission – irrespective of which mission interpretation is being examined – is viewed as an important pursuit. Valuation (determining what is most important) is an integral area of improvement, as members of the organization decide what their priorities and commitments will be when approaching daily assignments.

5.2. Knowledge Construction and Sharing

Participants seek to make sense of their work environment in terms of how they understand the array of relationships within and between systems. These responses provide insight for RQ2, “How is knowledge communicatively constructed between activity systems during an organizational change process?” and RQ3, “How is knowledge sharing enabled and constrained between activity systems during an organizational change process?” As with the previous section, we discuss trade-based activity systems and management separately due to the disparate ways participants discussed knowledge construction and sharing between these systems.

5.2.1. Between-System Coordination in General

This type of knowledge was gained through collaborative projects or efforts with other systems, as well as by articulating past observations to the interviewer. Participants related understanding by reflecting on instances when their group was engaged in coordination with other shops, by comparing their system, and by considering other systems without regard to their system's direct involvement.

Constructing others. Workers attempted to construct other shops by claiming that they are largely isolated. Consider the following quote from Ulysses: “We become very territorial as shops. This is

mine, don't touch it." Systems are conceited and critical of others. They hold that different communities possess various levels of competence and skill. Workers are viewed as lazy, but still make accountability a priority in most cases. Some participants think workers only do what is required to complete their personal duties. However, many workers do attempt to be collaborative with others and demonstrate knowledgeability.

Constructing joint identity in interaction with others. Participants constructed their unique joint identity with other shops in coordination by highlighting many positive –and a few negative– workshop takeaways. Many see workshop opportunities (and training in general) as a valuable time to interface with the entire organization. They learned from their interaction with different systems that social distance between areas is vast and systems include a spectrum of effort. As Frank noted:

"But, you know it's not to say that all the workers are good, I mean we have our problems with them, you know, facilities, you're always going to have some that are really dedicated and some not so dedicated."

Espousing to a team mentality and negotiating continuous conflict also highlight various tensions that workers from different systems must face when helping each other on common projects.

5.2.2. Between-System Coordination – Management, Constructing Knowledge

This knowledge is shared by many participants, both inside and outside the management activity system. Both groups actively constructed who management is, who the workers espouse to be, and each group's unique identity as they coordinate together. Cross-system coordination, despite schemes to avoid or otherwise deflect it, is an integral part of the organization's central activity.

Constructing management. Great attention was paid to management's behavior, through which several designations (mostly negatively valenced) were provided. These constructions of management differ from those previously included, as these were offered by employees that are outside observers and of the management system, recipients of their structuration. Management, including lower and higher-level groups, are viewed as inconsistent, incompetent, and isolated, exemplified by Seth's comment: You know, I talked about upper management and the lack of communication there. I think a lot of it is I'm going to say some names here but I'm not blaming anybody. [Management member 1] has a completely different personality than [management member 2] does. [Management member 2] is likeable; he'll come talk to you. [Management member 1] has a personality where he's within himself and he just doesn't express any emotion or thanks to people when they do something. They are seen as making certain attempts or approaches at addressing organizational issues. Power imbalances also ensue, which includes a pointed critique that an excess of management personnel overshadows the rest of the employee base.

Constructing workers. A fair amount of attention was also given to constructing workers. Affect issues, such as discouragement and lack of motivation plague front-line ranks. They are viewed as isolated, engendering a passive nature. Barney noted:

But not all the workers particularly, not all the areas have that comfort that they'll be protected. And some of them don't want to make the change and if people are not willing to have the behavior or attitude that we'd like... Many are, however, considered supportive, despite a large power imbalance in the hierarchy.

Who we are in interaction with each other. When these two groups interact to coordinate action and knowledge, they take on new characteristics. Employees reflected to construct who they are in interaction with management by emphasizing the importance of workers to management and to the functionality of the university campus. They admitted that there are prominent disconnects in that vital relationship, with much tension accompanying coordination.

5.2.3. Coordinating Elements

The only coordinating elements that addressed knowledge construction and sharing were in participant comments about personal opinions and their identities.

Personal opinions and values. This code included principles for approaching work, wherein leader-member relationships, coordination, change, ethical work behavior, handling demands, and consequences were discussed. Workplace ideals, including supportive relationships, top-down alignment, productivity, shared power, and openness were also important to participants.

Well I probably, what I like to go out there and give the service to other people that I would like to get the service for myself. I like people coming, doing the job with a positive attitude, and make me feel good they're there because they want to do the job and I'm their priority right there and right then to do the best they can for me. (Cameron)

Constructing myself. Members of the organization actively constructed their identities during the interview by describing functional tasks and duties, personal labels, and their tenure in the organization. Affective states were described as involving both personal discouragement and contentment. Members demonstrated their knowledge of the required work and inner tensions about their contribution, exemplified in Nick's comment,

"And me, of course, I feel I'm a lower class. That's how I look at it as. I still feel accepted but there's a lot of times where I do feel like the scrungy old janitor, you know."

6. DISCUSSION

In sum, findings indicate that exclusive and inclusive coordination generate strained knowledge construction and relationships between systems in this organization. Tension exists particularly

between management and other systems. Degrees of alignment are achieved through community support, strong personal identification, and employee-oriented managerial attempts to improve culture and process. Misalignment can be traced to wide differences in objects and rough boundary spanning. Areas and activities are contested, and direct and indirect power struggles persist. We apply findings to previous research and propose theoretical contributions of this study. We also provide practical suggestions for improving collaboration.

Results provided insight for how systems at a facilities management organization coordinate and construct knowledge during planned change. We found that within different relational contexts (i.e., within and between systems), individuals and activity systems demonstrate propensities for inclusive and exclusive coordination, which are indicated not only in action but also in how participants constructed knowledge of others and themselves.

6.1. Theoretical Contributions

Results of this case study contribute to a more nuanced understanding of organizational knowledge communication by explicating relationships between knowledge sharing, knowledge construction, and ongoing activity coordination in a complex organizational change process. Theoretical insights can be gleaned from situating sharing and construction as processes within coordination. As indicated by Figure 2, these three processes are understood as nested and iterative. That is, activity coordination, knowledge construction, and knowledge sharing are repeatedly and continuously articulated, and are co-implicated in ongoing activity. Analysis guided by SAT provided insight into how members of intersecting activity systems draw on their own mediating elements to accomplish activity while at the same time coordinate with other relevant systems to accomplish the overall activity of the larger organization. During activity coordination, they must share knowledge to function effectively. Through sharing, members co-construct new knowledge about the object of activity, about others, and about themselves. However, this case study clearly indicated that ongoing communication that creates a culture of exclusivity hindered all three processes, particularly through communicatively constructing negative identities of members of the management system by front line members and through management constructing negative identities of front line members. The organizational change effort to improve “collaboration” was met with suspicion and resistance because the ongoing pattern of exclusivity was not genuinely dealt with by those with authority.

How system coordination is communicatively constructed holds implications for how a specialized community, or set of communities, within intersecting systems are enabled and constrained as the organization accomplishes the overall activity. Community members may be constrained or enabled in terms of their ability to make decisions and determine their work. Constraints come by way of authority, social structure, and resources, among other elements, and are often enabled by the same. This study is unique in that it parsed system-level elements from individual and structural levels and observed how each level constrains and enables organizational knowledge processes during a management-initiated change process.

The graphic description of activity systems provided in previous research seems to indicate a separation of the subject and the object from activity with those elements contained in boxes outside the system triangle. Results of this project indicate that the subject and object are part and parcel of activity, and should be represented the same as all the other mediating elements. Accordingly, we propose a revision to the graphic representation of an activity system to remove boxes around subject and object, as presented in Figure 3 below:

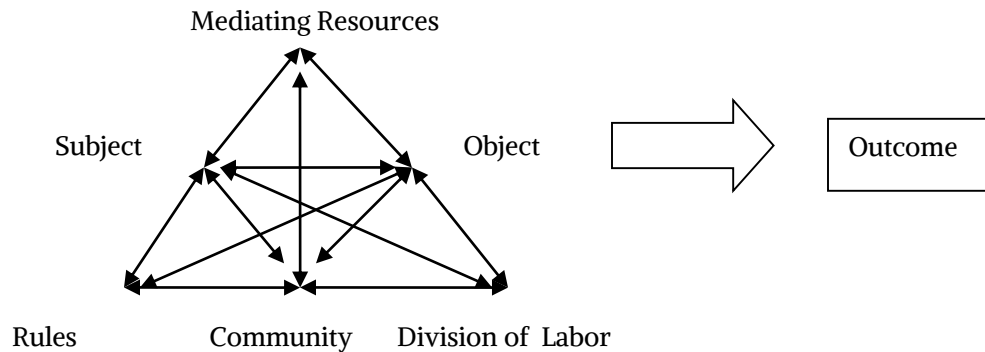


Figure 3. Activity System

Results point most readily to an acknowledgement of knowledge construction as implicated in the activities (including sharing) that accompany understanding. Knowledge construction is inversely also comprised of activities (including sharing), so we may observe these processes taking place as any combination of elements mediate coordination. Knowledge construction and coordination pervade activity systems. These cyclical and mutually influential processes of interaction and exclusion are inherent to the system, and play a role in structuring intersecting systems. Hence, members of FM identified with or against the organization in terms of communication related to membership negotiation and organizational self-structuring. In short, community members of activity systems structure new territory as they experience current and previous territories through tensions arising from contested divisions of labor, clashing dynamics of hundreds of subjects, and other mediated challenges.

Agency is noticeably squelched in work and planning processes. Although management possesses a greater amount of agency in terms of their flexibility and freedom to control outcomes and adapt structure, they are constrained by the programs they implement. Subjects in other systems often comply with what management dictates, but many isolate themselves by withholding key knowledge resources, including information. Subjects across non-management systems seek flexibility and control over outcomes and how activity is coordinated, so they construct new ways to interact with elements inside and outside their systems. Subtle coordination occurs outside the bounds of managerial control. In essence, participants in this facilities management organization bypass constraining structure by introducing subtle forms of interaction and system boundaries. These subtleties produce alignment with certain systems, and tension with others (especially management).

Object-oriented differences exist between all levels, which create a sense of constraint across different levels of the organization. Even some inclusive objects do not enable in the manner they are intended, partly because many systems do not adopt them. Concerns for pre-established, traditional objects facilitate some of the most rigid boundaries observed around systems. Objects serve to constrain the management system and how systems in general coordinate with one another. For instance, management seeks to implement innovative objects intended to reorient other systems toward progressive goals. Members of various FM activity systems are to consider their own system as a business. However, participants perceive that this object does not align with their central activities, and constrain management's success through refusal to repurpose resources, rules, and other elements. We discuss this contradiction more fully in the next section.

Fundamental approaches and conceptualizations of work differ, causing individuals and communities to reify system boundaries. They coordinate using mediating elements to demonstrate a spectrum of resistance-compliance. System members demonstrate a great deal of agency over their elements, especially resources (which include their physical work space). How elements are coordinated across system boundaries define in large part how permeable, and thus communicative, a system is willing to be. Some elements do not influence inter-system coordination as strongly as community, although each element plays a role in defining a system and its relationships with others. Many are preoccupied with what they deem unhealthy characteristics of the division of labor. Explicating different types of contradictions can contribute rich understanding regarding how these tensions and struggles are reified.

6.2. Contradictions in Change Efforts

One SAT proposition is that contradictions can be generative mechanisms to the extent that individuals attempt to resolve them (Canary, 2010b). Insights gleaned from this project illustrate ways in which this organization has yet to resolve contradictions. When left unresolved, contradictions become hindrances. Contradictions arose that highlight the conundrum management faces as they seek to implement relatively substantial change efforts in terms of task structure and work responsibilities. Management's efforts to scale change initiatives from abstract, higher order processes to specific assignment order are complicated by various conditions. For instance, members use their agency to understand and coordinate differently:

Yeah, if everybody would be led around instead of bossed around. It's like my job sometimes, I'll get an email from [Manager 1]. I'm trying to do facility [maintenance]. I do a whole bunch of stuff that I do. All of a sudden I'll get [Manager 2], "Hey don't do that." Well [Manager 1's] telling me to do it... So now is he pissed off at me because I didn't do it exactly how he wanted? He didn't know that [Manager 2] told me not to do it that way. (Zane)

What one manager intends might not only be interpreted differently by a front-liner, but also by a peer. Furthermore, management's fundamental objectives are different from many workers'.

Contradictions were manifested in various forms and are understood in terms of primary, secondary, tertiary, and quaternary types.

6.2.1. Primary

Primary contradictions imply that a system element may be used in ways that are in tension yet support overall function. Contradictions are to be expected to impact an organization as large and diverse as FM, with many different specialized trades represented within its functional borders. One shared object is customer service. Virtually the entire organization is keyed into improving customer experiences and outcomes. Customers present major challenges for systems in the form of a primary contradiction. They are perceived as the lifeblood of each system's existence in that worker jobs are dependent on work orders coming in and being completed. Yet, customer complaints and demands constrain workers from accomplishing other objects, as Cameron reflected,

"And a lot of times I have so many things out there, jobs I've gotta take care of. Sometimes it's not about putting out fires it's about keeping the fires under control, you know?"

6.2.2. Secondary

Secondary contradictions occur when new elements are introduced that are incompatible with current system conditions (Canary, 2010b). For instance, power struggles crop up endlessly over how and when a job is completed. Management expresses often and consistently how they seek to empower employees, yet workers continue to feel oppressed. Management seeks bottom-up feedback, yet front-liners still believe they are part of an authoritarian "regime." New programs and processes involve imposing new rules on systems, which in many cases do not align with those already established, or with existing divisions of labor. Workers consequently reject any program, however well intentioned, partly by a recognition and dissatisfaction that new elements do not comport with those they are used to using.

For instance, management seeks to improve efficiency and interdependency in work processes. Despite management's efforts to involve lower levels of the organization through workshops or presentations, feelings that a power imbalance prevails continue to permeate the ranks of labor. This highlights a key trend in the data, that a newly introduced object is giving rise to an inclusive/exclusive tension among the ranks. Bob asserted,

"What leadership is doing is causing a tension. And the tension is probably what has caused more fire in the way they do things rather than what they're doing. They're not very user friendly, upper management."

Often the manner in which they collaborate with workers on projects or introduce a new direction to employees remains a sore spot. Part of the animosity among workers appears to derive from simply having to perceive their role differently, but much of it also comes from perceiving that new processes or programs inconvenience their effectiveness. Diane noted:

They've isolated everybody. They've isolated their own shops to function a certain way instead of teamwork. I mean the guys will say, 'Oh yeah, we're teamwork,' well no, they're buddy-buddy and they'll have coffee with the guy but to say, 'Hey we need to dig that hole so I can come back and repair' –they're not going to do that.

6.2.3. Tertiary and Quaternary

Tertiary and quaternary contradictions can exist simultaneously in the same initiative. Tertiary contradictions occur when a more advanced object replaces a previous one which reorients the entire system and its elements. Quaternary contradictions arise between systems when central activities come into opposition. In this organization, tertiary and quaternary contradictions are one in the same, as objects are clashing while new objects are being introduced in the same change process. For instance, some managerial members' objective for activity evolution includes desires for work and responsibility to become entrepreneurial in nature. However, many front-line workers continue to hold fast to traditional views of maintenance – that their job is to keep the lights on and keep water in the pipes. They have trouble seeing their job any differently than keeping campus running, especially if their central daily activity is to offer some type of upkeep service, such as cleaning bathrooms or fixing doors.

As entrepreneurialism is pushed from the top, systems are encouraged to add to or alter their functions. Members of the various systems find a major overhaul difficult, as a progressive object might not align with their current set of rules, community, mediating resources, subject orientation, and division of labor. This action is intended to do away with the “good ole boy club.” In other words, workers are no longer just punching the time clock, but are expected to creatively go about increasing their business and cutting waste. This is met with resistance as a chorus rings out, “If it ain't broke, don't fix it.” The directive generates an identity crisis, and threatens to reform long-held personal and system-level objects, principles, ideals, and activities.

Each type of contradiction currently appears to hinder the progress of change implementations. The stalemate is more solidified as the management activity system continues to interact with other systems, and as systems make sense together of the management system. Exclusive communication pervades these contradictions, which imply several practical adjustments for improving the culture and change efforts.

6.3. Communicative Construction and Coordination Within Organizations

Individuals identify with or against systems (including their own) in terms of whether mediating resources, rules, and objects are inclusive or exclusive. They consider themselves part of a particular community to the extent they perceive that their style of coordination is reflective of others in the system.

The four flows model of CCO explains how an organization emerges and is sustained through communication among people (McPhee and Zaugg, 2000). Results in this study indicated that systems within the larger organization undergo similar processes of boundary establishment as the organization. Much like the essential flows of communication which foster organizing, inter-system change is ongoing and cyclical. Change does occur in this organization, as participant references to past events indicated. In order to understand what represents change, we must understand that the organization is grounded in action (Fairhurst and Putnam, 2004). If stability is rooted in continuous flows of communication, to identify change is to note progression or shifts as they occur in social practices. If the organization is anchored in continuous flow of action, streams of interaction within and between systems likewise should participate in the same or similar flows. Change occurs when system communication varies from typical organizational, cross-system, or within-system interaction. Change is caused when activity coordination (i.e., communicating and sharing elements) generates unique outcomes that restructure elements and systems in ways that compliment and challenge specialized knowledge.

The nested model of knowledge and activity coordination (Figure 2) provides a new way to conceptualize how the four flows of communicatively constituting organizations function specifically in the domain of organizational knowledge. All four flows (membership negotiation, activity coordination, self-structuring, and institutional positioning) were evident in this longitudinal case study of an organizational change initiative. However, activity coordination and membership negotiation emerged as the most influential for knowledge sharing and construction. Activity coordination provides the context for developing knowledge across specialized systems within the organization. At the same time, individual and group identities, as conveyed by participants about themselves and about others, emerged as an important factor that mediated how knowledge was shared, what knowledge would be constructed, and how activity coordination would be accomplished. “Us/them” dialogue demonstrates a preoccupation among system members and is often a closed frame masquerading as open, especially when reinforced during self-structuring. This kind of structure is more prone to dichotomous positive/negative valence. As members negotiate their own position with “we” –or as belonging to a particular system or set of systems– system boundaries are thrown in flux. Self-structuring takes place in basic and complex ways through positioning oneself and their group in comparison to the rest. Tensions persist and remain when inclusive and exclusive action simultaneously characterizes cross-system interaction.

6.4. Practical Implications

Facilities management organizations undergo constant change, even multiple times per year (Higgins, 2009). Major communicative drivers this FM organization management should be aware of include, but are not limited to, strong isolative behaviors, avoidance, inclusivity/exclusivity imbalance, object discrepancies, and contradictions. Warranting additional attention, front line members may perceive ongoing change differently than their managers do. Some view change in a positive light while others cast negativity around implementations and managerial efforts. At FM, identification and change are

mutually influencing perceptions about communication and processes, primarily on grounds of enablement and constraint of workers and job efficiency. One example is how the organization utilizes available technology.

AiM, the learning management system utilized by FM, structures work in complex ways. As workers and management tailor technological capabilities to their own needs and preferences, the system becomes neither entirely constraining nor enabling. Nearly all activity systems do not utilize many functions of the technology. As management seeks to change ongoing central activities within various systems, AiM is applied in narrow and short-sighted ways, thus subtly constraining workers to perform work in particular orders using precise accountability measures. These conditions are responded to in various ways. If FM is to integrate AiM as an enabling force among front-liners, management (especially lower levels) must be willing to tap data analysts for engineering personalized applications. As each system personalizes AiM capabilities, customized functions will alleviate at least some inappropriate structure created by applying basic standards to unique groups. Management can invest time and collaboration in considering how useful metrics can be collected while still respecting the autonomy of workers. They can consider how to best monitor the work without making their front-liners to sense unrestricted surveillance from above.

Participants confirmed that various forms of knowledge are structured in this organization. Individual and collective concerns abound across divisions, as well as tacit and explicit forms of knowledge construction. Commonsense and systematic forms of knowledge take form in expressed personal work ideals and principles, as well as through commentary on work processes. Inextricable power-laden knowledge was noted in participants' frustrations and perceptions of their own and other systems. Knowledge at FM relies heavily on experiential impressions and interactions. Members of FM are actively constructing their membership, their leaders, and their daily work experiences. Knowledge construction processes create senses of *me*, *us*, *them*, and *we* – *me* being a sense (or framing) of self, *us* being my own group or system, *them* being other systems or those who I do not identify with, and *we* being who we are as a cross-system team through our interaction with each other.

The key to understanding what is healthy about each frame requires paying attention to communicative consistency across each frame. If an employee has consistency within the *me*, *us*, and *them* frames, but perceive wildly different realities in the *we* frame, they do not experience a unified work environment. Members of FM would benefit by observing the discrepancies across frames, and alleviate disconnects. For instance, management looks to align the levels of the organization. They want supervisors and team leads to consider themselves part of management. They want each worker to understand their place in the big picture, and feel empowered to go about accomplishing their role in the collective. Culture change cannot be outsourced, but rather leaders in various systems can promote healthy and effective organizational change by incorporating inclusive communication across all levels of the organization. Every system in FM can identify ways to incorporate more

inclusive language within their communities, and can become more collaborative by adapting their objectives and coordination to others' styles. For management in particular, this mean participating with employees in a hands-on way in their implementations and trainings, and for workers this means extending their willingness to identify with individual and system goals and elements to serve broader organizational ideals.

6.5. Limitations and Future Directions

As with all studies, this project has limitations. Findings would have been enriched by included a larger number of participants and by gathering survey data, which could have solidified themes, increased the sample size, or further highlighted contradictions. Because we only interviewed 27 individuals in an organization with a total over 400, we were not able to fairly and equally represent each work division. This could have caused overemphasis in certain themes or omission of important other perceptions that we were not able to identify.

A related limitation includes our personal constraints as researchers. The lead author was given certain tasks to accomplish with a demanding time frame to do so. Management constrained the time and type of interactions with employees. We were also limited by their demands as they got behind enough in their work order completion by just attending workshops, which prevented many extended conversations outside of our time allotment.

This study presents several opportunities for future scholarship. Contradictions need not remain dichotomized as generative or hindering. Rather, a focused analysis might further tease out nuances and relationships between contradictions (as we did with tertiary and quaternary contradictions), and show different forms can influence change. Researchers can extend our vocabulary beyond unproductive and productive outcomes to more rich explanations of what communication through contradiction does to knowledge processes and outcomes, particularly between intersecting activity systems.

Another future direction is informed by one salient participant comment, "They're men, so they don't want to ask directions." Researchers may seek to interrogate and compare knowledge construction across forms of work, especially within specialized trades, to identify how gender informs knowledge processes across systems. Lastly, this study can be extended by critical/interpretive scholars by observing how hegemony perpetuates through organizational layers to structure what counts as knowledge and how it is constructed across specialized activity systems. Such analysis might shed light on how elements structurate knowledge within and across boundaries in different types of organizations.

7. CONCLUSION

Knowledge and coordination are communicatively constructed within and between systems. By structuring knowledge and coordination (and important elements in that process) in what they say and how they frame their experience, participants either actively or inadvertently legitimized societal-level signification and domination structures. They both draw on and reproduce the banes of bureaucracy and the constraints of government/public work in how they operationalize rules and resources, as well as navigate divisions of labor. Participants used their agency primarily in terms of identification as they pitted themselves against other systems, associated with their own or other systems or with other structural levels inside and outside the organization. Even in constructing constraint, they identified as members of the organization (however strained that relationship might be). In this organization, constraint and enablement are inextricably entwined. Their enactment of inclusivity and exclusivity shaped ways that specialized knowledge was constructed across intersecting activity systems. Those knowledge processes were hindered by unacknowledged contradictions that pervaded the organization. However, those same contradictions could be used to leverage system transformations and future progress in cross-system knowledge construction if they are used as starting points rather than ending points.

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