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CAUSAL EXPLANATION IN THE COORDINATING PROCESS: A CRITICAL REALIST CASE STUDY OF FEDERATED IT GOVERNANCE STRUCTURES[1]

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Large, multi-unit organizations are continually challenged to balance demands for centralization of information technology that lead to cost and service efficiencies through standardization while providing flexibility at the local unit level in order to meet unique business, customer, and service needs. This has led many organizations to adopt hybrid federated information technology governance (ITG) structures to find this balance. This approach to ITG establishes demand for various means to coordinate effectively across the organization to achieve the desired benefits. Past research has focused on the efficacy of various coordination mechanisms (e.g., steering committees, task forces) to coordinate activities related to information technology. However, we lack insights as to how and why these various coordination approaches help organizations achieve desired coordinated outcomes. This research specifically identifies coordinating as a process. Adopting the philosophy of critical realism, we conducted a longitudinal, comparative case study of two coordinating efforts in a federated ITG structure. Through a multifaceted approach to scientific logic employing deductive, inductive, and retroductive elements, we explicate two causal mechanisms, consensus making and unit aligning, which help to explain the coordinating process and the coordination outcomes observed in these efforts. We additionally elaborate the operation of the mechanisms through the typology of macro–micro–macro influences. Further, we demonstrate the value of the causal mechanisms to understanding the coordinating process by highlighting the complementarity in insights relative to the theories of power and politics and of rational choice. The study contributes to our understanding of coordinating as a process and of governance in federated IT organizations. Importantly, our study illustrates the value of applying critical realism to develop causal explanations and generate insights about a phenomenon.

Keywords: Critical realism, causal mechanisms, coordination, coordinating process, consensus-making mechanism, unit-aligning mechanism, federated IT governance, case study

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The appendices for this paper are located in the "Online Supplements" section of the *MIS Quarterly*'s website (http://www.misq.org).

Introduction

Information system managers are challenged to balance global efficiencies of standardized integrated solutions and the responsiveness of customized solutions to local requirements (Bartlett and Ghoshal 1998; Weill and Ross 2004). On the one hand, they seek efficiencies from information systems (IS) leading to standardized information technology (IT) infrastructures (Broadbent et al. 1999) and common, integrated software systems that cross unit boundaries (Pawlowski and Robey 2004). On the other hand, they must meet expectations of customers, suppliers, and partners, which are heterogeneous across business units, leading to the need for customized, local solutions. These competing demands are driving an increasing number of multiunit organizations to adopt some form of federation for IT governance (ITG) (Scott et al. 2006) wherein IT infrastructure is managed centrally and systems development is decentralized (Sambamurthy and Zmud 1999; Weill and Ross 2004).

While balancing tensions between autonomy and synergy, federated governance also creates structural barriers to alignment between the central and unit IT groups (Brown 1999). Decision-making and reporting relationships, which are split between central IT and the business unit management responsible for the unit-level IT function, inhibit communication and collaboration between central and unit IS managers (Brown 1999). The lack of coordination in the federated ITG structure can lead to a number of problems, including higher costs through the duplication of projects across organizational units; inefficiency and inflexibility due to implementation of incompatible technology architectures, infrastructures, and business applications by different units; and diminished value to the enterprise for investments in IS (ITGI 2006; Weill and Ross 2004). Specific coordination efforts are required to alleviate these problems, to overcome the barriers to alignment, and to realize the desired organizational performance objectives in federated IT structures (Brown 1999; Sambamurthy and Zmud 1999).

These challenges are particularly relevant when organizational units in the federated structure have similar products and services, customers, management processes, and IT capabilities which form the basis for organizational synergies (Tanriverdi 2006; Tanriverdi and Venkatraman 2005). The lack of or ineffective coordination typically results in conflict and intensified political processes due to competition for resources (Strassmann 2005). Ultimately, failure to establish effective coordination in the federated ITG can result in wasted resources through duplication and diseconomies of scale, increased costs, degrading of operational excellence through the selection of suboptimal projects, and reduced productivity (ITGI 2006; Strassmann 2005).

The Role of Coordination Mechanisms[2]

Coordination is a central concept in organizational design theory (e.g., Galbraith 1973; Lawrence and Lorsch 1967; Thompson 1967). Prior IS research has focused primarily on assessing the efficacy of various coordination mechanisms, including both structural overlays and nonstructural devices, in a variety of organizational settings (see Brown 1999). Other recent work has addressed coordination based on steering committees and communication policies related to IT use and capabilities (Huang et al. 2010; Prasad et al. 2010), as intra- and interorganizational relational networks (Gittell 2002; Gittell and Weiss 2004), for knowledge sharing and boundary spanning (Kellogg et al. 2006; Pawlowski and Robey 2004; Tanriverdi 2005), and related to outsourced IS implementation outcomes (Sabherwal 2003).

These coordination mechanism studies evaluate various combinations of formal structures (e.g., steering committees, task forces, policies/procedures) and informal, people-focused techniques that have been used to establish coordinated action. This research has yielded valuable insights into factors associated with success or failure of various mechanisms to achieve coordination in a variety of IT contexts (e.g., project management, outsourced IT project implementation, and interorganizational networks). For example, certain combinations of coordination mechanisms (Brown and Ross 1996; Brown and Sambamurthy 2001; DeSanctis and Jackson 1994; Gittell and Weiss 2004; Kellogg et al. 2006), number and composition of participants (Blanton et al. 1992; Clark 1992; Drury 1984), level of executive involvement (Earl and Feeny 1994; Huang et al. 2010; Raghunathan 1992; Sharma and Yetton 2003; Torkzadeh and Xia 1992; Weill and Ross 2005), and various organizational factors such as company size, organizational complexity, and competition (Brown and Sambamurthy 2001; Doll and Torkzadeh 1987; Sambamurthy and Zmud 1999; Schwarz and Hirschheim 2003) have been related to different levels of coordination, and these levels of coordination have been associated with positive and negative organizational outcomes involving IS use (Brown 1999; Clark et al. 1997; Gittell and Weiss 2004; Prasad et al. 2010; Sabherwal and Kirs 1994; Tsai 2002).

However, our understanding of how these various coordination mechanisms produce outcomes in a particular organiza-

[2]The term *coordination mechanism* as described here is taken from organizational information processing theory (Galbraith 1973). In critical realism, the term *mechanism* has a specific meaning that is discussed below. We use the term *coordination mechanism* when referring to the formal and informal overlays used to coordinate and the terms *causal mechanism* or *generative mechanism* when referring to the critical realism concept.

tional and IT governance setting is underdeveloped. Thus our objective is to shed light on what we will define as the coordinating process *by identifying causal mechanisms that play a substantive role in explaining outcomes observed when specific coordination mechanisms (e.g., formal and informal overlays) are applied within a particular organizational setting*. We are not attempting to identify an exhaustive set of all causal mechanisms involved as the coordinating process unfolds. We seek to identify and describe mechanisms that play a substantive role in explaining observed outcomes and to demonstrate the value of critical realism in developing these types of causal explanations. We do so by examining two coordinating efforts at a large public sector organization through a longitudinal, comparative case study in the critical realism philosophical tradition (Bhaskar 1997, 1998).

The paper is structured as follows. First we describe the philosophy of critical realism and a conceptualization of the coordinating process from this perspective. Next, we present our research methods and a detailed explication of the key events and structures in the cases. We then describe two causal mechanisms identified through retroduction—consensus making and unit aligning—that help to describe the outcomes observed. We explicate the operation of the mechanisms through the typology of macro–micro–macro influences. The efficacy of these mechanisms is corroborated based on the case data and the complementary insights offered relative to theories that have been applied to the study of the coordinating phenomenon. Finally, we discuss our contributions to the critical realism, coordination, and IT governance research.

Critical Realism and Coordinating

This research was conceived and conducted based on the philosophy of critical realism (Bhaskar 1997, 1998; Mingers 2004a, 2004b, 2006; Sayer 1992; Smith 2006). The ontology of critical realism assumes the world is real and exists independently of our ability to experience it. This reality is stratified, consisting of three nested domains. The *real* includes all physical and social entities (i.e., structures) that independently exist and their inherent causal powers (i.e., generative mechanisms) which may be activated in a specific context. The *actual* includes the events generated by these mechanisms. The *empirical* includes those events that, if generated, are observed. The epistemology of critical realism is interpretivist in nature, assuming that our knowledge of structures, mechanisms, and events is constrained by our ability to access only a portion of the events that occur, and is historically and socially constructed and thus inherently subjective (Bhaskar 1997; Mingers 2004b; Sayer 2000).

Bridging the concepts of positivism and interpretivism, critical realism leverages ontological stratification and the concept of emergence to offer a different perspective on causality (Wynn and Williams 2012). "What causes something to happen has nothing to do with the number of times we have observed it happening" (Sayer 2000, p. 14). Rather the focus is to describe causality by detailing how focal events are produced by mechanisms emerging from the structures, actions, and contextual conditions in a particular setting. Causality is not deterministic as structural entities exist in open systems and have causal powers which may be enacted and interact with the powers of other entities (Archer 1995; Sayer 2000). Using retroduction "we take some unexplained phenomenon and propose hypothetical mechanisms that, if they existed, would generate or cause that which is to be explained" (Mingers 2004b, p. 94). It is an effort to describe the unobservable elements of the real domain that must exist to have generated the observed pattern of events (Pawson and Tilley 1997; Tsang and Kwan 1999).

The extant literature offers a wide array of definitions of coordination. As can be seen from Table 1, which presents a number of widely used definitions, coordination has been defined both as a state or condition of an organization and as a process (Cheng 1984).

Several themes can be extracted from these definitions. First is the concept of interdependence of tasks. Related to federated ITG, the focus is the nature of interdependence that exists between units in the organization. Second, the definitions of coordination relate to outcome achievement. Ultimately people, resources, and actions are coordinated for a purpose. In the federated ITG, this is achieving organizational outcomes while meeting the local needs of autonomous subunits. Last is the concept of process. An organization may establish a state of coordination between units at a point in time, but that state can be maintained only to the extent that the environment is stable, participation is continuous, work tasks and activities are stable, products and services do not change, and the means of coordination are maintained (Morgan 1986).

From the critical realist perspective, a *structure* of coordination incorporates many elements. These include formal or informal means of aligning interdependent activities (i.e., what the coordination literature would term as the coordination mechanisms used), the individuals engaged in this work, the positions that these individuals hold within the organization and related to the focal effort, and the resources available to them to pursue the identified objectives. Structure also captures the policies and rules (e.g., the charter or bylaws that establish operating procedures, rules on how deci-

Table 1. Definitions of Coordination

Definition
Coordination means integrating or linking together different parts of an organization to accomplish a collective set of tasks (Van de Ven et al. 1976, p. 322).
Coordination is managing dependencies between activities (Malone and Crowston 1994, p. 90).
Coordination is the process that manages interdependencies among activities (Fan et al. 2003, p. 2).
From the perspective of network theory "coordination [is] an activity that is fundamentally about the connections among interdependent actors who must transfer information and other resources to achieve outcomes" (Gittell and Weiss 2004, p. 132).
Integration (or coordination) is "the [state of collaboration] that exists between departments and the process by which this state is achieved" (Lawrence and Lorsch 1967, p. 11).
Coordination is defined as the extent to which the work activities of organizational parts/members are logically consistent and coherent. It concerns the degrees of functional articulation (or unity of effort) between various parts of the organization (Cheng 1983, 1984, pp. 832-833).
Coordination is the process through which people arrange actions in ways that they believe will enable them to accomplish their goals (Quinn and Dutton 2005, p. 36).
Coordination is a temporally unfolding and contextualized process of input regulation and interaction articulation to realize a collective performance (Faraj and Xiao 2006, p. 1157).

sions will be taken, or how unit representation is determined) for the coordination mechanism that impact the participants engaged in the effort to achieve organizational objectives through interdependent work. The dynamic nature of the internal and external environments confronting organizations makes the idea of a constant state of coordination impractical (Faraj and Xiao 2006; Jarzabkowski et al. 2012). From the CR perspective, the structure of coordination embodied in the coordination effort manifests causal mechanisms that generate events which in turn reflect a state of coordination. We conceptualize these events as representing the enactment of the coordinating process and a progression toward achievement of organizational objectives. These events also provide indications of changes in the coordination structure and to the contextual influences within which it exists.

Within a federated ITG model, the focus of the coordinating effort becomes the process of establishing and maintaining coordinated action among organizational units through the operation of coordination structures, and continuous alterations of these structures, to promote desired business/IT outcomes in dynamic environments. In essence, it is the unfolding of events (i.e., the process) generated by the inherent properties of the coordination structures that we seek to explain. Thus, from a critical realist perspective, we define *coordinating* as the ongoing process of integrating information, resources, activities, and people across different interdependent parts of an organization to accomplish enterprise goals.

Research Design

Critical Realist Case Study

The longitudinal case study has been recommended for conducting a critical realist search for causal mechanisms (Dobson 2001; Easton 2010; Sayer 1992). The literature offers philosophically oriented models for conducting critical realist research (e.g., Bhaskar 1997, 1998; Danermark et al. 2002; Mingers 2006) and a limited number of empirical studies are available in the IS literature that adopt critical realism and the case study method (e.g., Bygstad 2010; Morton 2006; Smith 2011; Strong and Volkoff 2010; Volkoff et al. 2007). This study employed the methodological principles offered by Wynn and Williams (2008, 2012) to support the conduct and evaluation of CR case study research. These principles include explication of events, explication of structure and context, retroduction of mechanisms, empirical corroboration of hypothesized mechanisms, and adoption of triangulation and multiple research methods. A brief description of each principle is presented in Table 2.

The principles do not recommend specific case study methods, but rather identify essential elements needed to derive theoretical statements of generative mechanisms. The methodological principles are interrelated and mutually dependent. Our presentation of this case study, the analyses performed, and the findings are based on these principles and on the relationships identified (as shown in Figure 1). A CR-

Table 2. Description of CR Principles (Based on Wynn and Williams 2012)

Principle	Description
Explication of Events	Identify and abstract the events being studied, usually from empirical experiences, as a foundation for understanding what really happened in the underlying phenomena.
Explication of Structure and Context	Identify components of social and physical structure, contextual environment, along with relationships among them.
Retroduction	Identify and elaborate upon powers/tendencies of structure that may have interacted within a specific context to generate explicated events.
Empirical Corroboration	Ensure that proposed mechanisms have causal power and that they have better explanatory power than alternatives.
Triangulation/Multimethods	Employ multiple approaches to support causal analysis based on a variety of data types and sources, analytical methods, investigators, and theories.

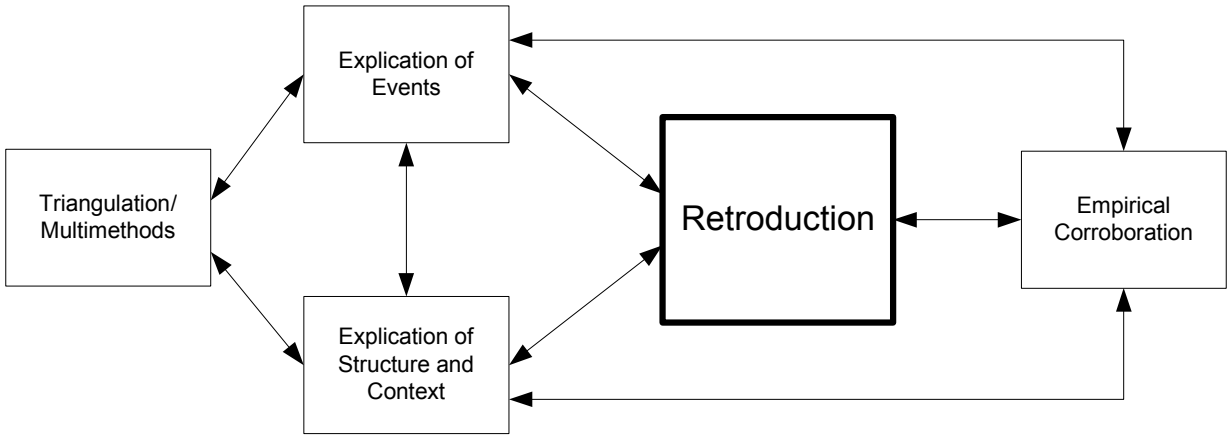

Figure 1. Relationships of CR Methodological Principles (Wynn and Williams 2012, p. 797)

based case study is an iterative process. The first step involves identifying and describing the critical events which delineate the phenomenon of interest. The explication of structure and context builds from the event analysis to identify what in the research setting is causally relevant (i.e., identify which structures and what aspects of context are potentially causally relevant to the observed events). It also provides a means to refine the description of the key events. The analysis of the events and analysis of the structure occur simultaneously and iteratively. Next, the logic of retroduction is used to describe potential causal mechanisms that could explain the observed events. Finally, the presence and efficacy of the mechanisms are confirmed through empirical corroboration. As each principle is addressed other principles may be revisited to ensure that the identified causal mechanisms provide a compelling explanation of the outcomes within the particular research setting.

Field Site

To address our research questions, we conducted an in-depth, longitudinal case study within a single organization. The research site, known by the pseudonym Large Pub, is a large, public institution in the United States. Large Pub has an annual budget exceeding $1.4 billion, over 10,000 employees, and offers similar services through 15 major divisions. It utilizes a federated IS structure with central IS responsible for the core infrastructure and enterprise applications, and with the autonomous service divisions responsible for hardware and end-user system functions.

This site was selected because of the potential to generate detailed insights into the structures and mechanisms that generate the coordinating process through the study of two

coordinating efforts[3]—the IT Advisory Council (ITAC) and the Business Process Analysis Exploratory Group (BPA). The research design employed was a comparative embedded case study design (Yin 2003) where each coordinating effort represents a case and the unit of analysis. Large Pub provided the opportunity to develop an understanding of the generative mechanisms driving the coordinating process in the context of a federated IS structure through an intensive study conducted over almost four years. Details of our data collection method are presented in Appendix A.

The first coordinating effort, ITAC, was a standing committee of business and IT managers from across the organization tasked to advise the CIO on enterprise use of IT and advocate enterprise IT initiatives within the organization. The ITAC was formally established in February 2004, and evolved through two changes in CIO from a body originally intended as the foundation of enterprise IT governance (February 2004 to December 2004) to a role of "advice and counsel" to the CIO (January 2005 to December 2006).

The Business Process Analysis Exploratory Group (BPA) was the second coordinating effort. Established by the CIO with the approval of Large Pub's executive management, the BPA was a task force of business managers and expert users from the primary functional areas working from November 2004 to December 2006. The objective of the BPA was to recommend an approach and a plan to replace the legacy systems supporting the four primary functional areas. The ultimate goal was the implementation of an enterprise IS supporting Large Pub's needs to improve customer services, achieve enterprise data integration, and improve cost efficiencies.

Data Analysis

The focus of the data analysis was to identify and explicate (1) the critical events associated with the two coordinating efforts, and (2) the elements of the physical and social structure and relevant contextual factors that combined to generate the emergent forces to produce these events. Our data analysis took a multifaceted approach to scientific logic employing deductive, inductive, and retroductive elements. We used a hybrid approach combining theory-driven template coding (King 1998) with inductive code generation methods (Boyzatis 1998). The literature on coordination mechanisms (e.g., Brown 1999; Gittell 2002; Sabherwal 2003; Sambamurthy and Zmud 1999; Thompson 1967) and on power and politics (e.g., Jasperson et al. 2002; Markus 1983; Pfeffer 1981) informed the coding process and provided the foundation of the base template which initially included 66 codes at the code and subcode levels.

The stratified coding process was based on the concepts of grounded theory (Strauss and Corbin 1998) as a data analysis method in the sense of leveraging "a continuous interplay between data collection and analysis" (Urquhart et al. 2010, p. 357). The objective was to identify increasingly abstract connections in the data through which the causally relevant elements of the social structure and context, and manifestations of the underlying causal mechanisms, could be seen. These may be exposed through the analysis of roles and relationships, rules and practices, actions, decisions, activities, and language and culture (Wynn and Williams 2012) related to the coordinating process and how these were understood by the primary actors. The initial coding combined the concepts of open and axial coding. Interview transcripts were coded in Atlas.ti v5.2 (Muhr 2004) using the coding template. As new concepts were identified, codes were created along with a definition for each. Code labels and definitions were constantly reviewed and revised to improve clarity. Axial coding was used to identify code categories and subcategories and to clarify their relationships. This generally followed the approach of identifying conditions, actions/interactions, and consequences (Strauss and Corbin 1998).

The initial coding included nine interviews (six from ITAC and three from BPA). The ITAC interviews were coded first to refine the coding template, and then the BPA interviews were coded to validate the coding template and to identify conceptual gaps. The revised template included 105 codes at the code and subcode levels. After all interviews were coded, only minor changes were made. The final result included 114 codes representing 1,530 text segments.

Next we used selective coding (Strauss and Corbin 1998) to analyze the axial codes through iterative comparisons of all coded segments to identify emergent themes and refine the code categories. These refined categories related the codes into higher level concepts. The approach was conceptually similar to that of Strong and Volkoff (2010), but involved the assignment of explicit selective codes. This allowed us to identify the most relevant elements of social structure and the specific context of the coordinating efforts including the operating mode, composition, coordinating climate, and engagement logic. The selective coding process generated 13 categories. The final code categories, definitions, and representative subcodes as well as assessment of reliability of the data coding are presented in Appendix B.

[3]A coordinating effort is a series of cohesive activities undertaken to achieve a specific organizational outcome requiring collaborative effort across different organizational units.

Event Analysis

As described by Wynn and Williams (2008, 2012), events are specific happenings resulting from causal mechanisms being enacted in some social and physical structure within a particular organizational context. Typically, events are abstracted from many empirical experiences related to the outcomes of interest. The event analysis sought to identify key points in each coordinating effort indicative of substantive changes in the structure, or the broader organizational environment, as perceived by the primary actors. These events then provided evidence of the causal chain in the coordinating process leading to observed outcomes.

The events in both cases were identified by the key informants during interviews, through observations, and from archival data. They were frequently the culmination of a number of related episodes, decisions, meetings, etc. For example, ITAC Event 4—IT Council Mission is Changed (described below) was the manifestation of a number of monthly meetings, the reappointment of committee members, and the appointment of a new chairperson, and it represented a fundamental, episodic change (Lyytinen and Newman 2008) in the nature of this coordinating effort. Each key event was validated across multiple respondents and at multiple points in time.

While the explication of events, explication of structure, and retroduction are presented in a linear, sequential way, the analysis occurred both iteratively and in parallel. Discussion of certain occurrences might identify other happenings (e.g., discussions, meetings, rule changes, e-mail, decisions) that lead to a reevaluation of a tentatively identified event or to consideration of completely different events. Similarly, discussions of important events frequently included elements of structure that provided ideas or clarification of the emergent forces at play.

ITAC Event Descriptions

Five key events were identified as having occurred during the IT Advisory Committee (ITAC) coordinating effort at Large Pub. Each of these events is described briefly. The detailed timeline for the ITAC case highlighting the five key events is presented in Appendix C.

ITAC Event 1—DITC Group Forms

At the advent of the ITAC coordinating effort, the IT governance structure at Large Pub was based on two committees set by the CIO, dominated by central IT projects and issues, and served primarily to push information from central IT to the divisions. With most of the large division IT directors (DIT) excluded, one summarized the situation:

> I felt sort of left out of the IT decision making process at the senior level….I personally felt we were being left out of the process and I wanted to have some means of input from [the divisions] into Large Pub level IT decisions (Large Unit DIT#1, 6/2/2004).

Early in 2002, and for 18 months, four IT directors from large service delivery divisions started informal monthly meetings. The group identified themselves as the Directors of IT Collaboration (DITC). The focus was to discuss and share information on a range of issues in order to improve division IT operations and cost efficiency.

> We were trying to figure out how we could help each other….We all have personnel to manage. We all have common infrastructures that we have to manage. Life for us was very similar, and we could share experiences and knowledge, and we attempted to look for areas where we could share products and services….It was also a recognition that if we could all agree on a common direction, then we had better chances of sharing these kinds of things (Large Unit DIT#4, 11/20/2006).

The influence of the informal networking group was substantive. When the group informed the CIO of their activities, the CIO formed a steering committee of the four IT directors and senior leadership of central IT. This opened new direct communications and provided the opportunity for the large divisions to have direct influence on the overall IT direction at Large Pub. The IT directors encouraged informal collaboration at the staff level between divisions. Through the meetings of the DITC, the large division IT directors established very open communications that evolved into a high degree of cohesion and trust.

ITAC Event 2—New IT Leadership

The activities and influence of the DITC IT directors became more prominent at Large Pub. The CIO sought to broaden participation first by establishing a larger informal group including IT directors and managers from smaller divisions and organizational units, and then by formalizing this group as a standing committee.

Early in 2003, the COO convened an IT Task Force (ITTF) to identify and prioritize IT requirements at Large Pub, and make recommendations to improve the value of Large Pub's IT investments. Several of the DITCs were ITTF members. The task force presented 21 specific recommendations to improve the effectiveness of IT at Large Pub. Based on the findings, the COO charged the ITTF to develop a new ITG model for Large Pub.

The CIO resigned from Large Pub in July 2003, and an interim CIO was appointed in September. The interim CIO focused on opening communication channels throughout Large Pub and building strong relationships with key constituencies. He became involved with the work of the ITTF to create the new ITG model, including convening a two-day offsite retreat in October for key participants that formalized basic elements of the proposed model. The interim CIO also sought to energize the standing committee of IT managers started by his predecessor by encouraging the committee to take ownership of its purpose and pursue initiatives with tangible results. He also joined the monthly meetings of the original DITC group of large-unit IT directors. The impact of the interim CIO was captured by one participant:

> [The interim CIO] was very collaborative, open, very friendly, and he pulled Large Pub together. That was a wonderful 15 months where we were all…I felt like we were at the cusp of a real cultural change. Between the activities of the DITC, IT Task Force, follow it then by the 15 months with [the interim CIO] actually pulling the group together, asking their opinions, asking them to do things. The environment had changed dramatically from the distrust and uncoordinated activities under [the prior CIO], and I think we had the chance to solidify it. People were getting comfortable with the concept of sharing information and talking to each other, and working together on a common platform (Large Division DIT #4, 11/27/2006).

ITAC Event 3—COO Conditionally Approves the Governance Model

Following the retreat, the IT Task Force reviewed and revised the proposed ITG model. The proposal was shared with all affected constituencies, and throughout, the model was refined and the supporting explanations clarified. A broad-based and general consensus emerged in support of the ITG model including formal endorsements by the several IT groups. The proposed governance model (see Appendix D) was formally presented to the COO in January 2004. As stated in the proposal,

> The main goals of the IT decision-making process will be to align IT with the Large Pub mission through the creation of an IT strategic plan, to link priorities for IT with budgets, and to foster and sustain a collaborative environment across the organization. The computing committees will focus on "what" needs to be done to advance [the four primary functional areas]. The IT Council will unify the recommendations of the committees to jointly identify "how" technology and resources can be used to accelerate the process (Large Pub IT Decision-Making Model Proposal, p. 2, 11/17/2003).

During this interim period, the COO supported the proposed model by identifying a division manager to become chair of the Information Technology Council (ITC), the standing committee at the core of the governance model, and working with the various functional vice presidents of Large Pub to identify potential functional committee chairs and participants.

The COO provided conditional approval of the proposed Large Pub ITG model in January 2004 and authorized the interim -CIO and ITC chair to proceed with implementation. The ITC started meeting bimonthly, chairs of the four functional committees were appointed, and nominations for committee membership were solicited. The COO withheld formal endorsement of the ITG model so as to allow the national search for a permanent CIO to be completed and to give the new CIO an opportunity to influence the governance structure. Most of the early activities of the ITC focused on formation with little done on developing an overall IT strategic plan.

ITAC Event 4—IT Council Mission Is Changed

In October 2004, Large Pub appointed a new CIO with experience in IT strategic planning and implementing enterprise software systems. The CIO made a concerted effort to create relationships and engage members of the Large Pub community. This involved direct contacts with key personnel and networking with various groups throughout Large Pub. The CIO developed an unfavorable assessment of the ITG structure, citing the lack of implementation progress as a shortcoming. The CIO conveyed this directly:

> I am not comfortable with the word "governance" and I am not sure Large Pub is ready for a "governing body" (11/18/2004 ITC Meeting).

> The other thing that we don't have is any kind of discipline in these groups. We don't have member-

> ship criteria. We don't have a rotation schedule. We don't have key initiatives that they need to be working on. We don't have a charter or a set of by-laws….We have not communicated any of this to the colleagues at large so they don't know where I'm coming from on this IT Council (CIO, 11/22/2004).

After several regular ITC meetings, the CIO convened a two-day retreat of ITC members to establish "the structure for an advisory body to the CIO who is responsible for the infrastructure of the IT core (network, enterprise data, voice, regulatory requirements) for Large Pub" (ITC Retreat Notes 12/2004). The retreat created a revised role and scope statement.

After consulting the COO, the CIO formalized and renamed the standing committee as the Information Technology Advisory Council (ITAC) in January 2005. The objective was to serve as an advisory body to the CIO. This entailed providing information to support a decision-making process led by the CIO. The CIO appointed a new chairperson, and formally appointed members to the ITAC to serve for nine months. This established that ITAC membership was at the invitation of the CIO and not based on other organizational roles within Large Pub. Bylaws were established and regular meetings of the ITAC and functional committees held. Tangible outputs during these nine months were limited to the review of several IT policies (e.g., e-mail use) and on informational and status updates on other Large Pub IT initiatives.

The ITAC did not have a substantive role in two enterprise IT efforts established by the CIO during this time period. One was a strategic planning process driven by Central IT. The second was the Business Process Analysis Exploratory Group (BPA)—the second case in this study. This limited the ability of the ITAC to fulfill its advisory mission and led members to question the purpose and role of the committee. One participant captured the challenges for the ITAC:

> When those initiatives were announced, there are assurances from the CIO that, "You are all going to be involved. You are an important part of this. We need your advice on this. Blah, blah, blah." Never in that process did we get any substantial information or have any opportunity for input…as a group or individually….Then when it comes down to, "Okay we are finalizing the report. After the senior management team has seen it, then we will present it to you." At the point where there is no longer any chance to influence it (Unit DIT#6, 11/2006).

ITAC Event 5—New Charge from the CIO

In October 2005, the CIO appointed a new ITAC chair along with new committee members. The next month, the CIO also initiated a formal ITAC Cabinet. The Cabinet was a steering committee including the ITAC chair, four functional committee chairs, a state regulatory agency representative, and a senior manager from Central IT. Its objective was to energize the ITAC, focus the efforts of the functional committees, and provide more decision-making support than was possible through the full ITAC. The CIO also established a new information security (InfoSec) committee on par with the four functional committees. The CIO sought to engage the ITAC through specific initiatives. The CIO directed the functional committee chairs, including the InfoSec committee, to identify two priority initiatives for their committee's activities for 2006. Only three of five functional committees fulfilled the request. The CIO requested advice on a number of central IT initiatives including a customer service portal, a new cycle of strategic planning, and information security education and training. None of the requests were positioned as strategic initiatives, tied to the initiatives of any of the functional committees, or presented as a specific charge to the ITAC.

The tangible outputs of the ITAC under the revised charge included two policies developed by the InfoSec committee. Most activities focused on status updates for other initiatives and the functional committees. The CIO attended only about 60 percent of the ITAC meetings and general attendance typically included only one half of the members. At several meetings, the CIO commented on the need to change the ITAC membership to include more customer input and restructure the committee. However, the CIO acknowledged a key challenge to effective ITG:

> The CIO at Large Pub was hired to be accountable for the use of all IT at Large Pub. But in reality, the CIO only has responsibility for maybe 60 percent of IT at Large Pub and budget responsibility for a lot less than that (8/2006 ITAC meeting).

In August 2006, the CIO presented a draft plan to reconstitute the ITAC and Cabinet for 2007 to establish an advisory model focused on the forecasting, strategic planning, project management, and identification of funding sources to support enterprise computing requirements. The draft plan effectively ended the work of the ITAC and brought this coordinating effort to a close. As the ITAC effort foundered, an interesting aspect of the coordinating process reemerged: three of the original division IT directors began meeting again in the informal DITC network.

BPA Event Descriptions

Four key events were identified in the Business Process Analysis Exploratory Group (BPA) coordinating effort.[4] The detailed time line highlighting key events is presented in Appendix C.

BPA Event 1—CIO Establishes BPA Exploratory Group

In July 2004, a data integration task force (DITF) appointed by the COO issued its final report. Recommendations focused on a technical solution based on in-house development to convert legacy systems to relational databases and implement a data warehouse to support executive decision making. Shortly after, the new CIO was hired. In his transition, the CIO learned of the work of the task force, the recommendations for data integration, and a variety of other enterprise IT initiatives. The CIO identified significant potential limitations in the recommendations of the DITF. In order to change the discourse on data integration, the CIO introduced the idea of focusing on the business processes required to support customer and organizational objectives.

> There was a Data Integration Task Force working on a data warehouse and data integration. This is not about the IBM mainframe. This is about the business processes that Large Pub would like its customers to be able to take advantage of and the reconfiguration or realignment or reorganization of human capital, infrastructure, architecture to enable that to happen. And using technology as best we can…just because we've done it for 30 years doesn't mean that's the best way to do it (CIO, 11/2004).

The CIO initiated an informal network of senior business leaders that had been involved with the DITF and other related efforts. Known as the Exploratory Group (EG), members represented the primary operational groups of finance and administration (finance), payroll and human resources (HR), customer records, and customer financial accounts (customer accounts). The division responsible for operational reporting was also included.

The group met informally over several months to discuss data integration issues. The CIO used these meetings to educate members on business process analysis and an external facilitator helped the group generate a statement of drivers for pursuing data integration. Responding to a supplementary budget request, the CIO and the EG developed a proposal for a formal business process review as the best next step in the effort to provide an integrated enterprise system.

BPA Event 2—BPA Responds to BPR Report

The proposal to conduct a business process review using an external consultancy was approved in early 2005. The BPA group was expanded to include 10 senior level managers. While not formally established by an official pronouncement from the COO, the purpose of the group as directed by executive management was clear.

> It set out originally to come up with a specific recommendation to senior management, being the senior vice presidents, COO and the CEO, about the need for data integration and the specific method, timetable, and cost of accomplishing it (Associate COO, 12/2006).

The group quickly engaged the services of a consultancy specializing in business process analysis and the public sector. Relying on his expertise in this area, the EG followed the CIO's recommendations regarding the consultancy and the scope of work. Consultant-BPR led Large Pub through a business process review (BPR) of the core business areas which described existing processes, and assessed them relative to industry best practices as manifest through integrated processes in a commercial enterprise software package. Over 5 months, hundreds of people engaged in facilitated sessions providing information for the process reviews. EG interactions were driven by the need to respond to the consultant and to begin synthesizing the accumulating process information (CIT Budget Director and Director for Planning, 12/2006).

Consultant-BPR compiled preliminary reports for each of the four functional areas. The draft reports were circulated, several meetings were held to discuss the findings, and members were given the opportunity to review and comment on the reports. These reports presented a largely negative assessment of the existing business processes and information systems to support Large Pub going forward. HR, Customer Records, and Customer Accounts requested few changes to the reports. Finance members perceived their report in very negative terms and requested significant changes to the BPR findings in their area.

> The BPA group went out, and when it saw things that were critical, potentially critical, and Finance took it as an evaluation or assessment of their unit.

[4]As was customary with the participants, the terms BPA and Exploratory Group (EG) are used synonymously.

> If somebody in their unit said something negative about the legacy environment, it was for the most part changed...at the top (VP HR, 12/2006).

> As a group, we would raise these issues in our meeting without Consultant-BPR to say that we really want to have the opportunity to correct this. We feel like it is very important because this report is going to be the basis upon which we start to develop a road map to achieve greater data integration, and a road map to determine the future for our core administrative systems. We really feel like this document needs to be as accurate as possible, and to reflect reality as closely as possible (VP Finance, 11/2006).

Reactions to the reports highlighted emerging differences in how EG members understood the purpose of the BPR and the concept of enterprise data integration. The process review exposed the level of customization within certain areas and the implications of changing these processes. The Finance VP identified the issue (11/2006):

> Our systems are designed [so] that you can have very lower level of employees initiating transactions. When you go on an ERP system, there is not as much data validity built into [it]. So you need to have people with a better skill set for initiating some of those transactions. It is not just that we are just going to change the way we are doing things, but there is going to be some real costs associated with that. There is going to be a different level of employee that is going to be required to make that a successful transition.

This led to differences in how the evaluations in the BPR report were interpreted, and the desire for changes to the evaluations.

> And the score sheets weren't very favorable. It was like "we've done this review and you've gotten bad scores." So there was a lot of resistance to the bad scores, real honestly, in areas that were going, "We're doing a great job." But the score was not , "are you doing a great job?" The score was, "is your system integrated?" My point of all of that is the fact that people reacted like that indicates there wasn't an understanding of what the process was (Associate COO,12/2006).

After additional revisions, the BPR report was finalized in late 2005. The process of responding to the work of Consultant-BPR had a significant impact on the BPA coordinating effort.

> I think that's probably when it became apparent that there were some fairly significant differences of opinion within representatives of the committee about how much needed to be done, what needed to be done, whether the Consultant-BPR evidence was compelling or whether it was actually…they missed the point (Director of Planning, 12/2006).

As the EG worked to finalize the BPR, challenges to the CIO's leadership were voiced in two ways: some EG members questioned the authority of the CIO in Large Pub (Controller 12/2006; Director of Planning 12/2006) and one member called for a new leader for the BPA effort.

> And actually Finance disagreed not only with the findings but even with my leadership. I mean the suggestion was made that somebody else maybe ought to lead this. I have no idea why, except that the findings of Consultant-BPR and I had worked with Consultant-BPR before. My qualifications didn't make squat difference (CIO, 01/2007).

BPA Event 3—Business Case Project

After the BPR, the EG determined more information was needed to make a consensus recommendation. This would require a compelling business case supporting the identified approach to an enterprise solution for data integration. The decision was made to retain a second consultancy to facilitate the evaluation of available enterprise system alternatives and to create the supporting business case. As expressed by the COO (01/2007),

> The outside view can be very helpful, and was essential in this case, in terms of understanding what is possible based on experience from outside the organization as well as understanding if the priorities are cost effective and will provide the necessary efficiencies.

Even while confronting severe budget challenges, the COO approved and funded the effort.

The Finance members identified the preferred consultancy for this project and worked very closely with the CIO to establish the project objectives and contractual arrangement.

> The purpose of the Consultant-Case was to help us with our business case analysis—what are the costs, benefits and risks of either doing nothing, revising our systems using in-house capability with in-house

> power to do so, or looking externally to vendor solutions (Controller, 12/2006).

From June through October 2006, the consultants worked with the EG on the business case analysis. After a month, Consultant-Case circulated draft findings to EG members. At the start of the project, the EG began holding regular weekly meetings, first to discuss issues identified and keeping the project on track, and then to review and refine the preliminary findings. The EG worked through revisions with Consultant-Case to refine alternatives under consideration. This review process was questioned by several participants as exemplified by the HR VP (12/2006):

> But I think people wanted to know from the experts like Consultant-Case, who had done this elsewhere, what they thought. And that's what they provided. And in many respects, we did a little bit of same thing in terms of challenging what they reflected back to us in terms of their view in their report.

The preliminary findings estimated the 10-year total cost of ownership for a packaged enterprise system (i.e., commercial off the shelf software or COTS) as ranging from $30 to $50 million. This represented a harsh fiscal reality that challenged the potential to move forward with any of the proposed options for data integration. Consultant-Case was asked to evaluate a fourth alternative based on a phased implementation of a COTS solution.

BPA Event 4—Final BPA Presentation to Executive Management

The final report from Consultant-Case was issued in late August 2006. The primary recommendation was for a phased implementation of an integrated COTS solution starting with the Customer Administration module to support the Customer Records and Customer Accounts functional areas. The report made clear that COTS was the best approach for Large Pub and that all four operational modules should be implemented. This confirmed the recommendations from Consultant-BPR. Based on input from Consultant-BPR and from Consultant-Case not included in the final report, it was generally accepted by the EG that the recommended, lowest risk implementation involved starting with the Finance module followed by HR and then customer administration. However, the Finance representatives would not agree to this approach. The challenge this posed to creating a consensus recommendation was expressed by one EG member:

> What the Consultant-Case people told us is that what you would like to do is start with your least complex piece and 99 percent of the time what I'm told is that is Finance. But instead, we're likely going to start with the most complicated and convoluted, which is the Customer Administration system. Now, if I were standing outside…I would say that is a stupid, stupid decision (Director Data Analysis & Reporting, 12/2006).

After the final report was presented, the state regulatory board requested proposals from Large Pub for new, incremental funds that could be used to further strategic priorities. The COO identified enterprise software for data integration as one priority. The CIO and Central IT Budget Director developed an implementation plan capped at $3 million per year based on reduced software licensing and maintenance costs through state contract pricing, using Large Pub IT staff to do a majority of the implementation, and phasing the implementation work (CIO 0120/07; CIT Budget Director 12/2006; and Controller 12/2006). This revised budget plan was circulated to the EG and was discussed as a final recommendation was being prepared.

The EG relied heavily on the final report from Consultant-Case to prepare its recommendation to executive management. The group met weekly over about a month along with significant electronic communications to finalize the recommendation. An issue developed immediately prior to the final presentation that highlighted the lack of consensus within the EG. The report from Consultant-Case recommended packaged software solution for all four functional areas. The majority viewed this recommendation as a *single vendor* solution. With the limited number of software vendors supporting the public service sector and standards established by the state regulatory board for enterprise systems, some members considered the product from *one* vendor as the only viable alternative for a COTS solution (Senior Manager Customer Information interview, 11/2006). However, the Finance members positioned other options such as a best-of-breed software from multiple vendors as a viable alternative (Controller, 12/2006).

In the end the BPA EG agreed to a final recommendation for an enterprise approach to data integration. The recommendation was for a phased implementation of COTS over 5 years, to include the implementation of all four functional areas (Customer Records, Customer Accounts, Finance, and HR) and starting with the two customer administration modules (CIO, 01/2007). The projected cost based on the revised budget estimates was approximately $3 million per year.

In November 2006, the BPA task force formally presented its recommendation to executive management. By all accounts,

it was a very positive meeting and the executives were highly engaged.

> [The executives] actually seemed very excited about this. It was a very positive meeting. They understood the need (CIT Budget Director, 12/2006).

However, near the end of the meeting a member of the EG challenged the CIO over the veracity of the revised budget estimates. This issue had not been raised previously. The fact that the issue was raised at the final meeting was a real surprise to the other EG members and generally viewed very negatively (Associate COO 12/2006; Director of Data Analysis & Reporting, 12/2006; Director of Customer Accounts, 12/2006). The budget estimation issue generated a number of questions from the senior executives. While addressed by the CIO and CIT Budget Director, the issue raised enough concern that the primary outcome was a charge to the CIO to revise the cost estimates and answer some questions regarding enterprise solutions in the 21st century (CIO interview, 01/2007).

The BPA EG had successfully fulfilled its charge and presented a consensus recommendation for an approach to data integration. Early in 2007, the CIO presented a revised budget analysis and a white paper on enterprise solutions to the executive management of Large Pub.

Structural and Contextual Analysis

The explication of structure and context analyzes the elements of social and physical structure and variations in contextual influences within the study setting to identify what is causally relevant to the identified events (Wynn and Williams 2012). In essence, the idea is to explain what about the structures, operating in that particular setting, might produce the events (Sayer 1992). In this study, the focus of our analysis was the social structures of the coordinating efforts at Large Pub such as key individuals and their relationships, formal and informal groups, rules and practices, and descriptions of key interactions.

The structural analysis involved two sets of activities which evolved concurrently with the effort to understand the critical events. First, the elements of social structure and the elements of the contextual environment most relevant to the ITAC and BPA coordinating efforts were abstracted through stratified coding. The elements of structure identified to have causal relevance include the operating mode and composition of the coordinating efforts. The relevant aspects of context include engagement logic and coordinating climate of the coordinating efforts (see Table 3). *Operating mode* describes the nature of the coordinating effort, its purpose and objectives, how the participants structure the work required, and how they engage with each other to achieve its objectives. *Composition* describes the configuration of the coordinating effort along several dimensions. These include the number of people, and what each participant brings to the coordinating effort individually and as representatives of various organizational units. *Coordinating climate* is one element of the context within the coordinating effort itself that captures those things that influence the nature of the working environment. These include leadership of the coordinating effort, perceived senior management support, and aspects of the interpersonal dynamics and attitudes, such as trust and the nature of communications, that the participants have in executing the work at hand. Finally, *engagement logic* captures influences from the participating units and the broader organization that affect the participants' commitment to the coordinating effort. The energy and intensity with which the individual participants engage in the work of the coordinating effort is influenced by perceptions that they have about the importance to the organization and potential to achieve substantive outcomes.

In essence, operating mode and composition incorporate the fundamental elements of structure for the coordinating effort while the coordinating climate and engagement logic describe the contextual setting *within* the coordinating effort. We also identified aspects of both the inner organizational and external environments, conceptualized in terms of Pettigrew's (1992) inner and outer contexts, that influenced the activities of the coordinating efforts by establishing the overall setting within which each operated. Finally, although part of the inner context, we captured organizational politics as a separate part of the organizational context at Large Pub within which the coordinating efforts operated. These different aspects of context represent concentric levels of influence that impact the coordinating efforts and are demonstrated in Figure 2.

Second, we specifically analyzed the changes in coordinating structure and context associated with the critical events. The focus was to refine our understanding of the important elements of structure, how these interact with each other and with the different aspects of the context, and to identify causal influences emerging from the structure. Related to each event, we explored how the operating mode, composition, coordinating climate, and engagement logic changed, and what influence the various aspects of the environment played. The approach to event analysis, depicted in Figure 3, in the form of "antecedent–event–consequent" analysis of key events to understand changes in structure is very similar to the critical realist oriented methods used by Lyytinen and Newman (2008) to explore the structural foundations of sociotechnical change.

Table 3. Coordinating Effort Structure and Context

Element	Meaning
Structure	
Operating Mode	Bases for fulfilling the objectives of a coordinating effort including the clarity of purpose, plan and method, defined outputs, and accountability.
Composition	The general arrangement of the specific actors in a coordinating effort including the number of participants, representation of organization units, organizational status, and organizational unit support.
Context	
Coordinating Climate	Contextual attributes which influence the efficacy and outcomes of a specific coordinating effort including effective leadership, executive management influence, trust between participants, and nature of communications.
Engagement Logic	Contextual attributes that influence the level of engagement from participants in a coordinating effort including relevance, importance, action orientation, and potential organizational impact.

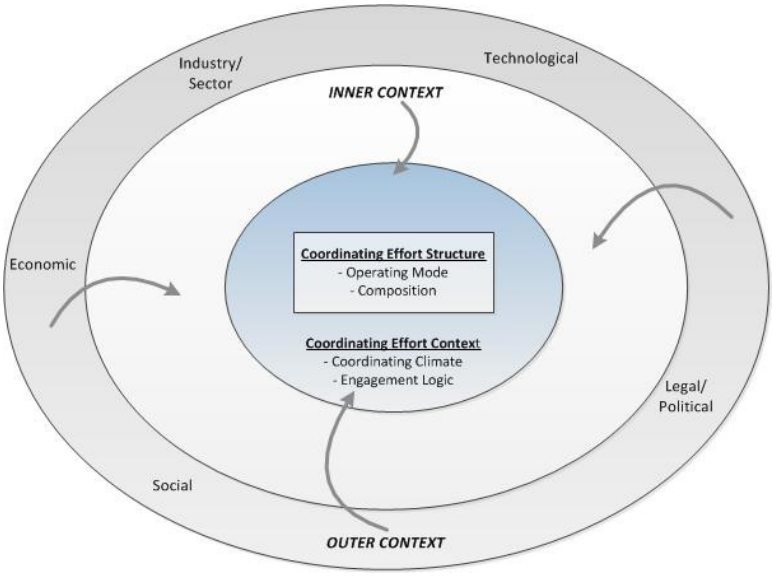

Figure 2. Levels of Context influencing Coordinating Structure

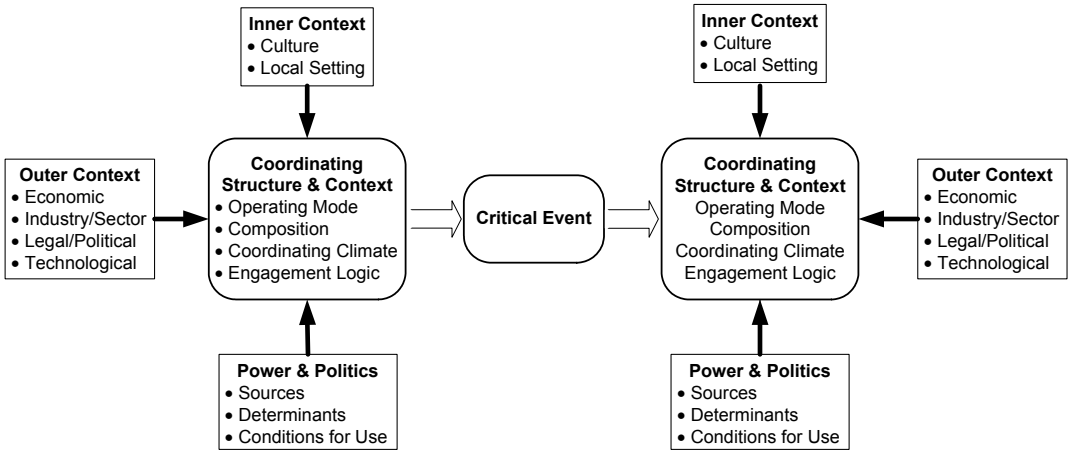

Figure 3. Structural Change Analysis

We found that the primary changes to the coordinating structure and context occurred in the operating mode and coordinating climate and the broader political environment. These are described in Tables 4 and 5 for the ITAC and BPA coordinating efforts respectively. We also found important, albeit less frequent, changes related to other aspects of the coordinating effort (e.g., engagement logic and composition) and the inner and outer contexts. Given their important effects, especially in the BPA case, inner and outer context are included in Tables 4 and 5.

The explication of events and the related structure analysis provide clear indications of the influences at play in determining the outcomes of the two coordinating efforts. It is from the fundamental nature of the social structures, exposed through a deep understanding of the event sequences and changes identified in these structures, that emergent forces responsible for producing the observed outcomes can be identified. This is accomplished through retroduction.

Retroduced Mechanisms

The essence of the critical realist study is to identify causes of the events of interest. These causes are the generative mechanisms that emerge from, and are irreducible to, the structures that exist where these events occur (Wynn and Williams 2012). Mechanisms exist in the ontological domain of the real and as such we rarely, if ever, can access them directly (Bhaskar 1998). Retroduction is a mode of inference through which "we take some unexplained phenomenon and propose hypothetical mechanisms that, *if they existed*, would generate or cause that which is to be explained," (Mingers 2004b, p. 94). Retroduction is a creative process in which the researcher explores alternatives to identify a compelling, logical argument that explains how events came to be through the inherent properties of the structure acting within the unique environment of the study context (Wynn and Williams 2012).

Applying retroductive reasoning to identify causal mechanisms, a core element of CR, is challenging. This is because retroduction is not structured or predictable. Researchers have offered some guidance on concepts of retroduction and various means to do it (e.g., Bygstad and Munkvold 2011; Danermark et al. 2002; Fleetwood 2011; Sayer 1992). However, the process of retroduction is not formulaic. Rather, it is highly creative, intuitive, and evolves over time. In this research, we sought to identify mechanisms that would explain the outcomes observed as opposed to confirming prior mechanistic explanations in the literature. This centered on retroducing mechanisms that would explain a particular critical event identified for a coordinating effort. Throughout data collection and analysis, we combined elements of the hierarchical coding, repeated readings of interview transcripts in detail and holistically, conversations with case participants, and elements of existing coordination literature into many different "thought trials" in an effort to capture emergent influences emanating from the interaction of the social structures of the coordinating efforts and the context that could help to explain the critical events. Having theorized the mechanism, we would then utilize case data to confirm its presence, adequacy, and depth (Runde 1998) in explaining the particular event. We then analyzed other events based on the proposed mechanism. The latter step is the process of empirical corroboration, which is closely linked to retroduction, and is described in detail below.

A brief example demonstrates our retroductive approach. The structural analysis abstracted operating mode as one primary element of the social structure. Clearly defined purpose and outputs of a coordinating effort are important dimensions of operating mode. In the BPA case, we observed multiple instances where primary actors used nearly identical descriptions of organizational priorities, existing IS capabilities, and concepts of data integration as the basis for actions and proposals that were incompatible, and even harmful, to achieving the objectives of the coordinating effort. This led us to consider what would emerge from the interaction of the coordinating effort purpose, the way the work was being done, and the accountability of the actors to their units and to the organization (i.e., the elements of the operating mode structure) to influence how the actors interpreted the basic nature of the data integration problem relative to the objectives of the autonomous units and of the organization as a whole.

We identified several potential causal mechanisms that might explain the key events observed. For example, we evaluated explanations based on a negotiation mechanism, centralizing and decentralizing mechanisms, and a power differential mechanism. As we explored the inherent properties of, and changes in, the operating mode and composition (i.e., the primary structures of interest), and coordinating climate and engagement logic (i.e., the primary contextual factors), our focus narrowed to the most likely causal influences.

Two mechanisms emerged as having acted in the ITAC and BPA coordinating efforts and that help to explain the outcomes observed. To facilitate the explication of these mechanisms, we describe the relationship of the mechanism operating within a specific context to produce the observed outcomes (Pawson and Tilley 1997).

Table 4. Summary of Coordinating Structure and Context Changes for ITAC Events

	Structural Elements	Contextual Influences		
Event	**Operating Mode**	**Coordinating Climate**	**Political**	**Inner/Outer Context**
1	The DITC group was based on clarity of purpose aligned with an appropriate vehicle of an informal network for achieving the strong personal relationships and trust necessary to create value from collaborations. *"I think the mutual nature of the interest. When we got together and discussed issues we had true common ground" (Large Unit DIT#2 6/04).*	An environment of confrontation and mistrust that developed around the CIO was replaced by interactions of the DITC based on openness and trust. *"The benefit of the informal group was I felt like it was a risk-free environment to just talk, to ask questions, to figure out on our own what was the best fit and to learn informally" (Large Unit DIT#3 6/04).*	Prior to the formation of the DITC group, many of these directors were excluded from existing coordination bodies. Once the CIO was made aware, the DITC group emerged as key players in IT coordination efforts. *"One of the biggest values was the recognition that we could have a significant influence on things that happen at Large Pub in terms of IT. We represented 80% of the Large Pub constituency" (Large Unit DIT#2 6/04).*	Severe state budget cuts had forced the federated units to seek out ways to provide services and solve problems more cost effectively. This was a constant influence throughout the ITAC coordinating effort.
2	The interim-CIO focused the effort to create a formal IT governance structure leading to the creation of the draft model circulated across Large Pub. This clarified and formalized the purpose and objectives of the ITAC, the methods of operation, and the expected outputs.	The COO made management of IT investments a strategic objective with clear direction and visible support. *"The COO's ITTF…meant that IT was on the radar of the senior management….It was a wake-up call to people" (Large Unit DIT#1 6/04).* The interim-CIO's style encouraged openness and trust, and challenged IT bodies to be action-oriented and focused on tangible results. *"The leadership that the interim-CIO brought, his biggest gift to us was empowering the DITC and other folks at Large Pub to create these wonderful opportunities for collaboration (Large Unit DIT #3, 6/04).*		
3	Broad consensus supported the proposed governance model. The COO's conditional approval disrupted its implementation. The ITAC functioned at a basic level; but the primary objectives of strategic planning and gap analysis were not realized. *"We were ready to put it in place. The COO said, "Wait, I want the new CIO to have a say on this, so just hold.' We met as the ITAC for a year… but there was really no charge. But it became pretty clear right about that time, as we were starting to mimic the process, that there really was not a clear purpose." (Large Unit DIT #4 11/06)*	The ITAC lacked strong leadership. The unit business manager appointed ITAC chair participated at a minimal level. The COO had limited involvement, deferring until the appointment of a new CIO. Lacking executive involvement and effective leadership, the climate suffered and the coordinating effort started to stall. *"ITAC is operating on an informal basis right now. The chair doesn't even show. We're having meetings where the chair can't be there. This seems bazaar to me." (Customer Computing Committee Chair #1 9/04)*	Creating an IT Strategic Plan would require engaging the entire community. This needed formal endorsement by the COO to establish the status necessary to conduct a meaningful strategic planning process. The ITAC lacked the necessary influence to achieve this objective. *"We did not have a permanent CIO, and we were instructed not to get carried away until a new CIO weighed in on things. Right there you are neutered. You are a place-holder. There is no real authority, no charge, nothing terribly motivating to get behind." (Large Unit DIT #4 11/06)*	

Table 4. Summary of Coordinating Structure and Context Changes for ITAC Events (Continued)

	Structural Elements	Contextual Influences		
Event	**Operating Mode**	**Coordinating Climate**	**Political**	**Inner/Outer Context**
4	CIO formalized ITAC as standing committee to provide advice to and advocacy for CIO related to enterprise IS initiatives. ITAC shifts from central element of governance to support of CIO. Form and content of advice not defined. No clear relationship between ITAC and other IS initiatives (e.g., strategic planning, information security, BPA). *"ITAC should be vetting policy if not creating it. I may differ from the CIO on this in terms of the role of the ITAC. The CIO takes the position that the Office of the CIO is the creator of policy" (Employee Council Representative 12/06).*	ITAC leadership weakened as new chairperson appointed by the CIO lacked organization status, and CIO involvement declined significantly. COO had no visible involvement. *"When those initiatives were announced, there are assurances from the CIO that, 'You are all going to be involved. You are an important part of this. We need your advice on this.' Never in that process did we get any substantial information or have any opportunity for input" (Large Unit DIT #6 11/06).*		The CIO's changes to ITAC's purpose highlighted a resource allocation gap between Central IT and the units that the original ITG model tried to bridge. *"The desire is to align resource allocation with strategic initiatives through CIT that are presented by the CIO to executive management for approval and additional funding. However, this does not fit with the 70% of IT spending that is not managed by CIT. The process needs to include managers responsible for the larger portion of the IT budget into the decision-making process" (Large Unit DIT#3, 11/04).* Engagement declined as ITAC failed to produce tangible outputs, and no impact due to exclusion from major IT efforts. Attendance dropped as meetings focused on information sharing.
5	The CIO created the ITAC Cabinet and issued an initiative-based charge to the functional committees to clarify the purpose, methods and outputs. Confusion over tactical, project oriented activities, and the CIO's desire for input on long-term trends was not resolved. *"I am not sure whether the CIO has ever communicated it that clearly to the ITAC, what is wanted from them." (CIT Budget Director 12/06)*	Leadership and support were not consistent. CIO comments about the lack of results, and need for further changes to council structure and membership adversely impacted work of the ITAC. Draft plan from CIO to reconstitute the ITAC ended the coordinating effort.		

Table 5. Summary of Coordinating Structure and Context Changes for BPA Events

	Structural Elements	Contextual Influences		
Event	**Operating Mode**	**Coordinating Climate**	**Political**	**Inner/Outer Context**
1	The CIO convened an informal network of highly influential business leaders to address issues of data integration. Clarified objectives by establishing business drivers for data integration. Process analysis introduced as method to create consensus on an IS solution and not just the constraints of legacy IS. *"It set out originally to come up with a specific recommendation to the senior vice presidents, COO and the CEO, about the need for data integration and the specific method, timetable, and cost of accomplishing it" (Assoc. COO, 12/06).*	CIO provided strong leadership based on expertise, prior experience and clear executive support to change the nature of the dialogue on data integration. *"The charge to me when I came here [from the COO] was to move this institution forward and find a solution to manage this data in an integrated environment" (CIO, 01/07).* *"And so this is not about the IBM mainframe, this is about the business processes that Large Pub would like its customers to be able to take advantage of and the reconfiguration or realignment or reorganization of human capital, infrastructure, and architecture to enable that to happen" (CIO, 11/04).*		Primary operational systems were old, not integrated, often could not provide accurate data, or support cross-unit business processes. IS highly customized for functional areas. Legacy IS did not support enhanced customer services. Effort recognized by all as important to Large Pub, driven by influential participants, with potential for dramatic impact. *"The goal was to bring a set of recommendations to senior management for the actions they should take in order for us to move into a 21st Century environment for data management…. They were the critical players… [to] look at where we ought to be going in order to meet Large Pub's objectives" (CIO, 1/07).*
2	The Consultant-BPR interim reports generated reactions indicating that EG members did not know how to interpret the findings or use them to produce a recommendation for data integration. *"I think there was a fundamental misunderstanding about what we were doing with Consultant-BPR. Because there were a lot of words that were getting thrown around all the time as though everybody knew what they meant. And one of them was enterprise approach. I'd be willing to bet if you… [asked the EG] what enterprise approach means that you would be blown away at the lack of consistency in the answers." (Assoc. COO, 12/06)*	Executive leadership, by funding the business process review consulting project, enhanced and energized the BPA exploratory group. However, lack of sustained involvement by executive management created uncertainty. The EG had direct and emotional interactions while responding to the Consultant-BPR reports but maintained transparent communications and an environment of trust. Questions of authority called CIO leadership into question. Suggestion made for another to lead the BPA effort. *"I don't think the CIO had the perceived authority to follow through with this thing…maybe a lot of it is authority of the position or the perceived authority of the position" (Director for Planning, 12/06).*	Prior investments by Finance to upgrade systems to support highly customized business processes created resistance to negative evaluations and recommendations for change. *"Those who are invested in what they have and if it's working well, they don't see the value in changing… And so those who have worked on something, got it working, didn't see the need for change. And those others who have had tremendous difficulties with their pieces of the administrative data system could see the need for change" (Director Data Analysis & Reporting, 12/06).*	The BPA highlighted the level of unit autonomy and the challenges created for achieving enterprise data integration relative to functional needs. *"And the process review demonstrated to us how incredibly customized we are, and how Large Pub has grown to expect that level of flexibility and customization. It sent up some red flags to us that if we implement a vendor solution, we were going to limit the amount of customization, and what sort of ramifications that could have" (Controller, 12/06).*

Table 5. Summary of Coordinating Structure and Context Changes for BPA Events (Continued)

	Structural Elements	Contextual Influences		
Event	**Operating Mode**	**Coordinating Climate**	**Political**	**Inner/Outer Context**
3	Calls for business case analysis showed the lack of an overall plan to achieve the goal of a consensus recommendation. Consulting project becomes basis for completing charge to BPA. Accountability to executive management focused effort. *"[The BPR report was the consensus of group] because we kind of worked as a committee and everyone [finally] said 'Okay, that's right.' We reached consensus. And that kind of left us with a 'what we are going to do now?" (HR Director, 12/06).*	Executive management reassured importance by funding 2nd consulting engagement. CIO pushed effort forward by scheduling weekly meetings and focusing efforts on completing business case. *"The outside view can be very helpful, and was essential in this case, in terms of understanding what is possible based on experience from outside the organization as well as understanding if the priorities are cost effective and will provide the necessary efficiencies" (COO, 1/07).*	Finance recommended consultancy for business case project and was active in defining project scope. Preliminary findings generally confirmed prior work. Budget considerations and call for single-vendor solution lead to added analysis of alternative for phased COTS implementation. *"And there was concern from a couple of different viewpoints. One that the dollar point alone would be a killer for us, with this current budget situation. The second that there was not total agreement in our group, that we needed COTS for all four segments" (Sr. Manager Customer Information, 11/06).*	Reduced state funding and severe budget challenges limited options for large capital investment in new enterprise systems and influenced the entire coordinating effort. *"But then Consultant-Case came in and said 'big bucks!'…I think the reality sunk in. 'Oh my gosh! Are there reasons why we really need to do this?' Somebody has to be willing to fund it" (Controller, 12/06).* Majority consensus emerging in EG on need for single-vendor COTS solution as basis to achieve enterprise data integration.
4	BPA coordinating effort completed successfully by presentation of consensus recommendation with supporting business case to executive management.	Relationships between some EG members severely damaged by questions raised in final presentation. Trust and openness required for future implementation success undermined. Despite reservations by some senior VPs, and questions by some EG members, executive support was clearly stated in the end. *"In general, executive management is in agreement with the recommendations of the group on how to proceed. The customer administration systems will be the first areas addressed. Then the Finance and HR areas will likely be implemented into a single, common technology platform" (COO, 1/07).*	Clear recommendation for COTS as basis for data integration in all four functional areas challenged Finance's desire to maintain current IS and processes. Challenge to budget created confusion and doubts about the recommendation. *"A potential explanation could be that Large Pub was closer to a decision on a new enterprise system than it had ever been, and this could have been a 'last ditch' kind of attempt to slow down or stop the process" (CIO, 1/07).*	The ultimate decision to proceed with selection and implementation was dependent on confirmation of additional funding from the state. *"All have an understanding that this is a major investment that cannot be funded in a single year, cannot be completely funded internally, and will have to be funded over 3 to 5 years. Requests have been made to the State Regulatory Board for funding support and Large Pub will have to wait to see what support is available from the state" (COO, 1/07).*

A Consensus-Making Mechanism

The first generative mechanism identified was a consensus-making mechanism. This mechanism is the tendency of participants to engage in the creation of common meanings and shared understanding for what the coordinating effort is to accomplish, how the purpose is to be accomplished, and the language used to accomplish these. The consensus-making mechanism emerges from the interactions of key participants, and other aspects of the composition of the coordinating effort and its contextual environment. It emerges as participants, within this context, endeavor to understand and establish common ground so as to enable actions through the operating mode (e.g., plan, method, defined outputs) that transcend differences between federated units, and fulfill the objectives of the coordinating effort.

ITAC Case

As described in ITAC Event 2 and in Table 4, the focus of Large Pub's IT management was to fulfill the COO's directive to create an IT governance structure that would reduce costs and improve IT investment effectiveness across federated units (part of operating mode). The interim CIO offered new leadership that fostered openness in communications and inspired trust among the participants assigned the responsibility to create an ITG model (coordinating climate). The goal of creating an ITG decision process was highly relevant, and represented a real opportunity to address long-standing issues for all those participating as well as to the organization as a whole, and the clear and public directives from the COO established the impetus for action (engagement logic). Thus, the logic of engagement and climate of the coordinating effort established a supportive context within which the participants could operate.

These participants included a small, diverse group of senior IT leaders representing key constituencies (composition), and for whom a new approach to ITG was a compelling, urgent need (engagement logic). This composition provided a unique basis for change that another combination may not have been able to achieve. The participants possessed credibility based on established relationships and extensive experience within Large Pub as well as from extensive industry experience. They possessed sufficient status within the organization and their units to take decisions that could be sustained. And the interactions of the participants in the coordinating effort built on the openness and trust established by the IT directors described in ITAC Event 1.

Within the climate of the interim CIO's leadership and compelling engagement logic, the interaction of the operating mode and composition enabled the consensus-making mechanism to emerge. The participants pursued a clear purpose to generate a specific plan for a new ITG model within a defined time period. The interim CIO introduced new methods of interaction, such as an offsite multiday retreat, which altered the dynamics of discussions and problem-solving. The consensus-making mechanism allowed the participants to exhibit openness and flexibility in their work to overcome long-standing issues of large versus small unit representation, resource disparities, and relative priorities across organizational units to establish a balanced approach to ITG that all could support. This mechanism produced agreements on a decision-making approach to establish organization-wide project and investment priorities across the various federated units through a common strategic planning process, and the representative committee structure needed to implement this decision-making process.

However, as described in ITAC Event 4 and in Table 4, the new CIO sought to fundamentally alter the coordinating effort embodied by the ITAC. The CIO believed that the COO had given a clear mandate to move Large Pub to an enterprise perspective in managing IT investments, and to fulfill this mandate the CIO's purview extended to the use of all IT at Large Pub, including within the federated units. The CIO altered the coordinating climate by introducing a different, less participative leadership style that sought to elevate the organizational status of the CIO, and that undermined the environment of open communications that had been previously established.

Although participants faced the same context of engagement logic for improved decision making based on the importance, relevance, and potential impact of new ITG, the new CIO changed the composition of the ITAC coordinating effort. Additionally, the CIO introduced a new purpose whereby the ITAC became an advisory body to a decision-making process led by the CIO and senior management (new operating mode). This advisory body would not be responsible to Large Pub's senior management, including the CIO, for setting organization priorities across the federated units by leading the IT strategic planning process. Rather, the ITAC members were accountable, and only in an advisory role, only to the CIO. Thus, major elements of the operating mode of the coordinating effort were changed.

Although the purpose, accountability, and desired outputs of the committee changed (operating mode), the configuration of the ITAC and of the functional committees (see Appendix D) as well as most of the participants remained largely intact. Similar to the previous operating mode, the discourse within the committee centered on strategic planning, enterprise

priorities, decision making, governance, and IT core services. However, in contrast, the new plan and method for creating advice deviated from the established understanding shared by a majority of the participants. The consensus-making mechanism emerged from the conflicting perspectives on the means to achieve an effective approach to decision making that would set shared priorities for IT investments serving both organization and unit needs and the accountability of the participants in this approach. The consensus-making mechanism drove the efforts of ITAC participants to grasp what "advice to the CIO on IT strategic issues" meant, how it was to be created, how it was to be used by the CIO, and what impact and value this advice would have in terms of establishing organizational IT priorities or improving services provided through the federated units. It was also reflected in the CIO's repeated efforts to adjust configuration and composition of the functional committees, and to refine the outputs to be produced. Thus, the consensus-making mechanism moved the participants to demonstrate flexibility through various attempts to negotiate a common basis to achieve their purpose. This ultimately proved unsuccessful because the changes introduced, and explanations for how these related to the primary purpose of the group, failed to evolve into a shared understanding for the IT decision-making process. Rather, the consensus-making mechanism revealed irreconcilable differences between the CIO and unit participants in terms of purpose, plan and method, and outputs of the coordinating effort.

BPA Case

Looking at BPA Event 2 and in Table 5, reaction to the initial consultant's report shows how elements of structure interacted in the BPA context to generate the consensus-making mechanism which helps to explain the outcomes observed. A positive coordinating climate was established through executive management influence and the new CIO's perceived leadership based on expertise and experience. This combined with compelling engagement logic of clear need, importance, and the potential for tangible impacts of enterprise data integration to create a supportive context within which the coordinating effort operated.

The objective for the task force was to develop a consensus recommendation for implementing operational systems in the primary functional areas to improve data quality and integrity, increase the effectiveness of systems for both customers and employees, and improve the return on IT investment (operating mode). This purpose was clearly established by executive management, consistent throughout the effort, and reinforced at key points through the allocation of resources to support consulting engagements (coordinating climate). To establish the basis for its recommendation, the BPA performed the business process review with an external consultancy (method). However, the participants did not understand how to translate all of the work and outputs of the consulting project into a specific recommendation for enterprise data integration (method). This represented clear uncertainty about the nature of the approach involved and its utility. The consulting engagement surfaced enterprise-level business process issues. But these findings, and the basic terminology of the BPA effort (e.g., data integration, enterprise approach, vendor solution, business process review), did not carry the same meaning for all participants. The lack of shared language was exemplified by the Associate COO (12/06):

> We continually, over the course of these meetings, would come to these realizations that no one really was using the term enterprise approach in the way that the people who really know what that means use it.

The consensus-making mechanism emerged as the participants pursued numerous approaches to resolve the differences and negotiate a consensus path forward. Members worked with the consultant and each other to create a baseline assessment of existing capabilities acceptable to all. Finance representatives actively resisted the consultant's findings, trying to convince others that the existing systems already supported enterprise data integration. While others did not accept this view, the BPA did not establish a clear rationale for why it might be necessary for Finance to implement new processes and functionalities in packaged software to enable improvements in all functional areas as well as simplify enterprise data integration and support cross-functional workflows. Through an effort to promote consensus and shared understanding, the consensus-making mechanism was manifest in the negotiations and flexibility of the participants as several functional groups accepted the consultant's findings without change so as to advance to a resolution. Finally, this mechanism emerged as some task force members sought to clarify the direction and methods being used to develop a consensus recommendation (operating mode) and explored a change in leadership (composition) to drive the effort.

A Unit-Aligning Mechanism

The second generative mechanism emerging from the structure of the coordinating efforts is a unit-aligning mechanism. In the federated IT structure, autonomous units can have wide latitude in the extent to which they engage in centralized initiatives. The unit-aligning mechanism refers to the ten-

dency of autonomous units to engage in, or to resist, processes that bring unit and enterprise objectives and resource allocations into alignment. The unit-aligning mechanism represents a causal influence that, depending on the context in which it is activated, would promote either a process mentality or a silo mentality that would respectively drive the organization to either actively engage in or actively resist processes that align the federated and/or functional unit objectives with enterprise-level, organizational objectives. It may be reasonable to conceive of this potential for dual influence as two separate mechanisms. However, as will be shown, there is benefit to a more parsimonious conceptualization that encompasses both influences.

ITAC Case

Two ITAC events show how the unit-aligning mechanism emerged from the interaction of structural elements to help produce very different outcomes. As described in ITAC Event 1 and in Table 4, the small group of unit IT directors (composition) started meeting to share information (operating mode). All faced reduced budgets requiring increased IT investment effectiveness and the desire to enhance unit-level services (engagement logic). This context offered compelling motivation to engage collectively. Given the negative political environment, the IT directors opted for highly informal, offsite meetings with no set agendas and no defined deliverables (method). This operating mode fostered open, honest communications and high trust. Once trust and mutual respect were established (coordinating climate), the directors had very direct, practical conversations about real issues and weaknesses within their own units (method). The unit-aligning mechanism emerged from these interactions to produce new ideas about sharing resources and allocating staff to specific initiatives that could serve all of the units. While the units had significant differences in their systems infrastructure and staff capabilities, the directors identified means for collective action. The outcome was that the units shared application designs and code, coordinated training activities, and assigned staff to informal and formal initiatives to improve cross-unit collaboration. The unit-aligning mechanism also enabled these individual federated units to join together with a common voice that produced a new level of influence as the IT directors were included in formal groups led by the CIO.

As described in ITAC Event 5 and in Table 4, the elements of structure interacted to again generate the unit-aligning mechanism which, operating in a different contextual environment, produced different (coordinating) outcomes. The original ITAC operating mode was an enterprise ITG model designed to achieve greater IT investment effectiveness. This model utilized the ITAC to guide strategic planning through functional committees to identify IT requirements from across Large Pub, and then prioritize annual investment in enterprise IT initiatives to support organizational strategic goals. The organizational and budgeting structures at Large Pub, in which the majority of the IT spending occurred outside of the control of the CIO and Central IT, necessitated an operating mode (work methods, outputs, and accountability) for the ITAC that encouraged the autonomous units to align with organizational goals and initiatives. The unit-aligning mechanism would be manifest by the federated units actively engaging personnel in, and providing resources for, the decision-making process of and initiatives coming from the ITAC. The unit-aligning mechanism would also be manifest by the units contributing funding to support the prioritized initiatives. This was captured directly by one ITAC participant:

> There comes a point though ITAC…where being a part of that discussion, being a part of agreeing on appropriate direction, that if you do have resources, you might contribute to them. You may contribute to the institutional outcome (Large Unit DIT #4, 11/2006).

The CIO changed the operating mode and composition of the ITAC. The new method to identify enterprise IT initiatives was a strategic planning process directed by the CIO and focused on the core IT services defined and delivered by Central IT. The role of the IT departments in the autonomous units, and the large customer service units in particular, was de-emphasized. The ability of many units to influence the strategic initiatives through the ITAC was significantly reduced. The engagement logic (action orientation and potential impact) supporting the ITAC had been disrupted. As the pressures to simultaneously enhance investment effectiveness and unit-level services remained dominant, the unit-aligning mechanism drove unit IT directors to emphasize their unit objectives (i.e., adhere to a "silo thinking") as the best means to support perceived organization-level needs. Without the means to exert influence through the ITAC (operating mode), engagement waned and many participants withdrew. Due to a lack of substantive activity and tangible outputs, the CIO terminated the ITAC coordinating effort.

BPA Case

BPA Event 3 (also in Table 5) also demonstrates the retroductive logic for a unit-aligning mechanism. The primary aspects of the setting remained intact. The engagement logic

remained, and if anything had intensified during the prior consulting project as the participants understood the potential implications of a new approach to enterprise data integration. The setting encouraged participants to continue active engagement. Even with the difficulties of finalizing the prior consulting project, BPA members maintained high levels of trust and open communications. This supportive coordinating climate was extended as the COO authorized additional funding for the second consulting project (executive support). The participants clearly understood that barriers existed that would inhibit their ability to fulfill the primary objective of a consensus recommendation. The unit-aligning mechanism emerged as the participants struggled to resolve the gaps that existed in how the core problems of data integration were defined.

Prior efforts at Large Pub to address data integration and early discussions of BPA members framed the problem along two dimensions. The first was a system view in that the inability to achieve data integration related to antiquated technology and a lack of capable staff. In other words, the "systems" were the problem and if the technology were updated, the existing processes would adequately support operational needs. The second dimension was a functional view of the data integration problem. In key areas, finance and customer accounts in particular, the units believed that the existing systems and business processes fully met operational needs and provided high integration. The need for change to core systems was driven by other functional units, primarily Customer Records, where the existing systems could not meet operational needs. Problems with data integration were due to an inability to upgrade the legacy systems to newer relational database technology. Thus the functional view suggested that the data integration issue could be solved by upgrading the systems in the problematic areas.

The unit-aligning mechanism enabled the members to acknowledge and accept the validity in certain elements of these alternative unit-oriented perspectives, and seek out commonality through a business case analysis. It emerged from the key participants acting within the particular context. The members were clearly accountable for, and in positions to achieve, a consensus recommendation on data integration (composition). They had no choice, other than failure, to rationalize unit-level concerns within overriding organizational-level needs. The unit-aligning mechanism produced agreement on a business case analysis as a means to achieve the purpose (operating mode) of the BPA that would validate prior findings, and introduce new inputs into the decision process to help move the effort forward and enable the units to converge on a consensus recommendation supporting enterprise objectives.

A Multilevel Understanding of Coordinating: Unit Aligning and Consensus Making as Macro–Micro–Macro Level Mechanisms

Part of demonstrating the efficacy of the retroductive logic involves detailing how the proposed mechanisms bring about observed outcomes. For this we adopt the macro–micro–macro mechanism typology to identify how higher level structures and conditions influence individuals (macro–micro mechanisms), how individuals respond to these influences (micro–micro mechanisms), and how collections of individuals interact to produce higher level effects (micro-macro mechanisms) (Coleman 1990; Hedström and Swedberg 1998). This view aligns with Archer's (1995) morphogenesis approach, which proposes that human agency and structure influence each other in morphogenetic sequences over time. These sequences examine how structural and cultural factors shape actions and interactions among individuals (macro–micro and micro–micro), and how these actions and interactions subsequently reproduce or transform structure and context (micro–macro). In the ITAC and BPA coordinating efforts, a unit-aligning mechanism captures macro-micro level influences while a consensus-making mechanism describes micro–micro level influences. These relationships are presented in Figure 4.

Coleman (1990) describes macro to micro transitions in terms relating to the rules of the game that influence the nature and roles of the participants, how they interact, and the conditions in which they act. In the ITAC and BPA coordinating efforts, the unit-aligning mechanism influenced the relevance and importance of the coordinating effort to individuals (engagement logic) and thus their level of engagement in the process. When activated in certain contextual environments, unit aligning motivates individuals to engage in the coordinating effort and to invest the time, energy, and resources required to bring about coordinated outcomes. Where the right participants have appropriate plans to produce outputs that achieve a clearly defined purpose, unit aligning drives the participants to overcome parochial, unit priorities and adopt a process orientation supporting cross-unit, organizational needs (macro–micro mechanism). When the unit-aligning mechanism is activated in different contexts (i.e., adverse climate, diminished engagement logic), elements of structure may interact to produce influences resulting in individual units optimizing on unit-specific priorities at the expense of achieving broader enterprise objectives (i.e, reenforce silo thinking). This divergence of unit and enterprise objectives can produce reluctant engagement in a coordinating effort, a guarded coordinating climate, and reduced participation. In this context, the consensus-making mechanism is unlikely to be activated or, if activated, the causal drive to find consensus will be hindered.

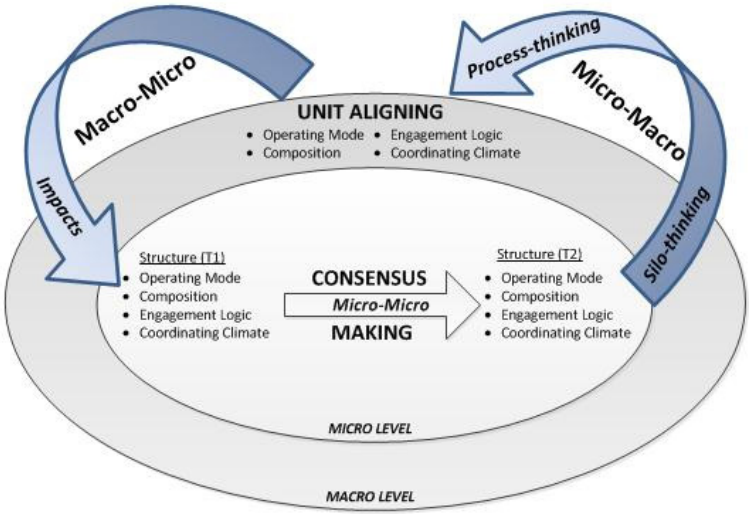

Figure 4. Causal Mechanism Macro–Micro–Macro Impacts

The process thinking generated from the unit-aligning mechanism fosters a positive coordination climate conducive to effective interactions. When motivated by compelling engagement logic, the participants interact with greater flexibility so as to find common ground. The consensus-making mechanism emerges to facilitate the convergence of participants on a shared understanding of what the coordinating effort is to accomplish and how (micro–micro mechanism). Where activated, the consensus-making mechanism is likely to reenforce elements of the climate within the coordinating effort (i.e., trust, open communications, perceptions of leadership) that foster achievement of the objectives.

The emergence of the consensus-making mechanism to produce common meanings and shared understanding can also activate the unit-aligning mechanism (micro–macro mechanism). Participants that have a basis for collective action, through shared understanding of and consensus for the operating mode, can adapt unit objectives and how they are pursued within the structure of the coordinating effort. In essence, consensus making drives participants to align unit and organizational objectives and to allocate resources differently in pursuit of these objectives. On the other hand, consensus making can also surface irreconcilable differences among participants around the operating mode. These differences, which may not have been apparent *a priori*, may surface as participants attempt to create consensus for the methods, objectives, and outputs of the coordinating effort. This would drive participants to a silo mentality and pursuit of unit objectives rather than organizational objectives. We provide a detailed explication of the macro- and micro-level transitions for the events in both coordinating efforts in Table 6.

Two events exemplify the full macro–micro, micro–micro, and micro-macro transitions of the activated unit-aligning and consensus-making mechanisms. In ITAC Event 2, the interim CIO introduced a number of changes to the Large Pub environment including a supportive leadership style and more open, inclusive communications. These fundamentally altered the coordinating climate. Additionally, the interim CIO expanded composition by adding broader representation of units at Large Pub in the effort to develop a formal ITG proposal. The entire organization confronted a pressing need to increase IT spending effectiveness (engagement logic). The structure and context interacted to generate the unit-aligning mechanism which produced a process-oriented approach (operating mode) to pursue improvements. This altered the environment within which the individual participants could develop an ITG model to support enterprise objectives (macro-micro transition). The participants actively engaged, supported by effective leadership from the interim CIO and visible executive involvement, which helped to foster the sense that meaningful change was possible. The consensus-making mechanism that emerged from this structure and context enabled the ITAC members to find common ground for governance methods (micro–micro transition) that supported both unit and organizational goals. Finally, the shared understanding and consensus for the process by which IT governance would be implemented permitted individual unit priorities and resources to be aligned to support Large Pub's goal of enhanced IT investment effectiveness (micro–macro transition).

A second example comes from BPA Event 2. The business process review exposed perceptions of unique unit-level

Table 6. Macro-Micro-Macro Mechanism Transitions

Event	Macro-Micro (UA)	Micro-Micro (CM)	Micro-Macro (UA)
		ITAC Coordinating Effort	
ITAC 1 *DITC Forms*	Large Pub goal to improve IT spending effectiveness in reduced budget environment. Common *engagement logic* (high relevance, potential impact), increasing customer needs, and negative *coordinating climate* (unsupportive CIO, lack of influence) combine to generate unit aligning leading unit IT directors to find new ways to engage and channels of communication *(operating mode)*.	Completely informal interactions amongst small number of directors with significant decision-making capabilities and taking place off-site (*operating mode*), promoted *coordinating climate* of openness and trust. Consensus-making mechanism emerges to produce common understanding of unit problems and identify opportunities to work collaboratively.	Consensus-making mechanism enabled directors to take specific actions and produce tangible outputs (shared code, cross-training, informal staff-level interactions, etc.) that re-enforced unit aligning through a process focus to enhance services across a small number of units. This supported Large Pub goal of improved IT spending effectiveness.
ITAC 2 *Interim CIO Appointed*	Interim CIO facilitated open communications to improve *coordinating climate* and expanded representation (*composition*). Unit aligning emerged to engage more units in efforts to create new ITG structure.	Improved *coordinating climate* permitted well-suited participants (*composition*) to negotiate (consensus making) an ITG model that effectively addressed broad spectrum of organization units and Large Pub objectives (*operating mode*) while promoting belief that real changes were achievable (*engagement logic*).	Detailed approach for creating strategic plan through ITG model enhanced perceptions that participating units could achieve local improvements while supporting Large Pub priorities thus reenforcing unit aligning that lead units to allocate resources to the ITAC effort.
ITAC 3 *COO Conditional Approval*		Initial commitment to ITG model and preliminary steps to activate it (*operating mode*) continued to enhance importance and belief that concrete actions were being taken (*engagement logic*), while strong leadership of interim CIO maintained positive *coordinating climate*. COO conditional approval (*climate)* delayed full implementation of ITG committees and strategic planning process (*operating mode)*.	Units committed staff and resources to support implementation of ITG model and other enterprise level coordinating efforts.
ITAC 4 *CIO introduces new model*	New CIO shifted focus of efforts to improve IT effectiveness to be based on shared services delivered by Central IT and deemphasized the needs/priorities of autonomous units thus undermining unit alignment and altering *engagement logic*.	CIO altered purpose and accountability (*operating mode*) and unit representation (*composition*), but kept basic elements of original ITG model. CIO leadership style negatively impacted communications and trust (*coordinating climate*). Activities produced limited work product as participants struggled to achieve a common understanding that reconciled previously established agreements on ITG with new advisory role to CIO.	
ITAC 5 *CIO refined charge*		CIO instituted additional changes to membership and committee structure of ITAC (*composition*) and proposed specific deliverables to encourage tangible outputs (*operating mode*). Members failed to develop clear understanding of how the refined ITAC related to establishing organization-wide IT priorities and improving unit level services.	Consensus making failed to produce common understanding for ITAC purpose and methods (*operating mode*). Combined with ineffective CIO leadership and communications (*climate*) focused on status updates to dissipate energy and intensity of members (*engagement logic*) and to members effectively withdrawing active *engagement*. Units re-aligned to pursuit of local goals and objectives.

Table 6. Macro-Micro-Macro Mechanism Transitions

Event	Macro-Micro (UA)	Micro-Micro (CM)	Micro-Macro (UA)
		BPA Coordinating Effort	
BPA 1 *BPA Established*	Prior initiatives established general agreement on the importance and potential impact of improved data integration (*engagement logic*). Senior managers from a majority of affected operational units (*composition*) were convened by CIO. Executive support through funding and visibility, and strong CIO leadership based on expertise and experience (*coordinating climate*). CIO defined a new business process based approach to find a solution for enterprise data integration (*operating mode*). Unit aligning emerged around need for new solution to achieve organization-level data integration.	Initial activities introduced by the CIO (*operating mode*), and visible executive support (*climate*) enabled to consensus-making mechanism to produce an enthusiastic but shallow shared understanding for using the business process review to develop a consensus recommendation for enterprise data integration.	The rapid emergence of shared understanding (though shallow) accentuated the importance and sense of action of the coordinating effort (*engagement logic*) and re-enforced perceptions that the effort would generate a solution for enterprise data integration that would meet both unit and Large Pub objectives (*unit aligning*).
BPA 2 *Response to BPR Report*	The importance, intensity of activity and potential implications of the effort maintained heightened *engagement logic*. The activities of the process review exposed unique unit needs within framework of the overall enterprise data integration goal (*operating mode*).	Reactions to the BPR reports exposed a lack of shared understanding within task force manifest through unit-level concerns. Members failed to understand how to use the information to develop a recommendation (*operating mode*). Consensus making produced agreement for units to respond to the report individually as way to complete the consulting project. Questions of leadership weakened the CIO but core trust and open communications remained intact (*coordinating climate*).	Systems and functional interpretations of problems identified in BPR report (*operating mode*) begin to highlight emerging differences in how unit needs were interpreted relative to need for enterprise-level data integration. Participants align to unit level issues in the absence of plan to move towards enterprise-focused consensus recommendation.
BPA 3 *Business Case Project*		Importance, need and impact of BPA effort (*engagement logic*) remained clear. COO support for new consulting project, open communications, and tactical leadership from CIO promoted progress (*coordinating climate*). Consensus making produced support for second consulting engagement as a new way to produce recommendation.	Participants recognized differences based on system and functional perspectives of data integration. Confirmation of prior findings and cost data for primary enterprise system implementation alternatives (*operating mode*) enable BPA members align unit needs to enterprise objectives and agree on key elements of a consensus recommendation to achieve enterprise solution to data integration.
BPA 4 *Final BPA Presentation*	Prioritizing unit operational needs over recommended implementation sequence of software modules introduces risks. This undermines shared understanding while highlighting new gaps in finalizing recommendation for best approach to meet enterprise data integration goal (*operating mode*).	Last minute questions about integrity of implementation cost estimates undermined trust (*coordinating climate*) and muted enthusiasm for consensus recommendation (*engagement logic*) but did not fundamentally change basic elements of BPA recommendation.	Successfully completed initiative (*operating mode*) defined consensus plan to implement commercial software in all functional areas aligning all units with organizational level goal of enterprise data integration.

needs relative to the goal of enterprise data integration, thus generating through the unit-aligning mechanism an emphasis on silo thinking (macro–micro transition). BPA members interpreted the business process review report differently and struggled to produce a shared understanding of its meaning and how to use it to achieve a consensus recommendation. The consensus-making mechanism emerged to establish agreement for individual units to take responsibility for their own part of the consultant's report so as to bring that phase of activities to closure (micro–micro transition). The consensus-making mechanism produced common ground related to tasks of the business process analysis, but had not altered the context sufficiently to enable the units to adapt an enterprise perspective as the basis for a consensus recommendation on data integration. In the absence of a clear plan to move forward, and with the leadership of the coordinating effort being questioned, the units continued to align to parochial interests regarding data integration (micro–macro transition).

Empirical Corroboration

Having retroduced causal mechanisms that provide explanations for the events and outcomes observed in the two coordinating efforts, we seek confirmation that these mechanisms are sufficient to have brought about the observed outcomes and were manifest in the research setting (Wynn and Williams 2008,2012). We sought corroboration of the hypothesized mechanisms in several ways: multiple participants, repeated confirmations over time and through multiple events, identification of other expected experiences, and multiple cases. Some variation of these means of corroboration have been used in other recent empirical critical realist research (e.g., Bygstad 2010; Easton 2010; Morton 2006; Volkoff et al. 2007). Appendix E provides a detailed description of our empirical corroboration methods and evidence.

Discussion and Conclusions

Limitations

We do not claim that the proposed mechanisms fully explain the outcomes observed. These explanations are tentative and subject to being refined or falsified in other study contexts. This does not necessarily imply discrediting the proposed mechanisms of consensus making and unit aligning. Rather, in open systems we can only reasonably expect that the same mechanisms, if present and activated in other contexts, will produce different outcomes (Bhaskar 1997, 1998). The proposed mechanisms do provide a basis to explain the outcomes in this specific case. They also provide a starting point by identifying the relevant structural entities and contextual factors through which to explore the coordinating process in other organizations adopting federated or other hybrid IT governance structures. Researchers should seek to identify new or different manifestations of structure, different organizational or external environmental conditions, the presence or absence of similar or additional contextual cues that may activate these causal mechanisms, and the presence of other potential causal mechanisms that may interact with consensus making and unit aligning that would explain outcomes in other coordinating efforts.

Complementarity with Other Theories

Adhering to the principles of critical realism, we have explicated causal mechanisms that played a substantive role in explaining the coordinating effort outcomes in one particular case setting. Part of the value of the critical realist approach is the potential to offer deeper insights into socio-technical phenomena (Wynn and Williams 2012). This can be demonstrated by evaluating the explanatory value of the proposed mechanisms relative to existing theories. Rational choice and power/politics theories are highly relevant to the study of coordinating in IT governance (e.g., Brown 1999; Goodhue et al. 1992; MacKenzie 1986) and respectively represent alternative micro–micro and macro–micro theoretical explanations that parallel consensus making (micro–micro) and unit aligning (macro–micro). They, therefore, offer a meaningful basis of theoretical comparison. Next we briefly frame these theoretical perspectives and discuss how the unit-aligning and consensus-making mechanisms complement insights offered by them.

Micro–Micro Complementary Theoretical Explanations: Rational Choice and Consensus Making in the BPA Case

From a rational data integration perspective, the costs associated with increasing information flows across the organization will be balanced against derived benefits (Galbraith 1973; Goodhue et al. 1992; Tushman and Nadler 1978) and, therefore, the decision for an enterprise data integration solution would be driven by a cost–benefit analysis. This is clearly a rational choice view whereby the decision processes are based on utility maximization as participants seek to maximize benefits while minimizing costs (Elster 1989; Simon 1987).

Applying this perspective, the BPA effort followed a rational approach to generate consensus for an enterprise data integration solution. The business process review demonstrated that the existing systems and processes were not adequate to

provide the desired enterprise data integration and identified the primary alternatives to be considered. The group members recognized the need for more information on the detailed costs and benefits associated with the primarily alternatives. With support from executive management, the group agreed to utilize a detailed business case analysis to provide the required cost–benefit information and identify the optimal approach of implementing a packaged software solution.

Complementary Insights from the Consensus-Making Mechanism

Reactions to the two consulting reports demonstrated the lack of understanding among group members. The Finance members evaluated the recommendations from both the business process review and the business case analysis based on utility maximization for their function even while holding to the belief that this represented an enterprise view. Other members evaluated the results from the perspective of maximizing Large Pub utility, even at the expense of process disruptions, lost functionality, and significant implementation costs to the individual functional units. The absence of shared understanding for the meaning of an enterprise perspective and the means to interpret and develop consensus from the available information exposed differences as to what constituted a rational choice. Thus, the two micro–micro explanations of rational choice and consensus making complement each other in that a consensus-making mechanism provides deeper insights to the rational choice explanation of the BPA coordinating effort. It provides the means to recognize the basis for the ongoing negotiations that occurred, related to the purpose, methods, and the ultimate output of the coordinating effort and the difficulties involved.

Macro–Micro Complementary Theoretical Explanations: Power/Politics and Unit Aligning in the ITAC Case

Conditions that lead to use of power in decision making include actor or unit interdependence, conflicting goals, scarcity of shared resources, and differing beliefs about cause and effect relationships (Pfeffer 1981). This is particularly true in IS when there is disagreement about the nature of the IS problem, uncertainty about proposed IS efficacy, when bases of power are valued and limited, and when information systems are distributed in organizations across units (Markus 1983).

Examining the concepts of power and politics within the ITAC coordinating effort offers a different macro–micro view of the events in the ITAC case. In short, four large-unit IT directors met to share information, find ways to gain budget efficiencies, and gain a voice at the enterprise level. These directors gained influence and with the interim CIO drove the creation of an ITG model. A new CIO joined Large Pub with a mandate from executive management and a specific agenda for pursuing enterprise IT solutions to improve return on IT investments. The mandate afforded the CIO full leverage to restructure the coordinating effort. The CIO articulated a belief that he was solely responsible and accountable for IT strategic planning and decision making at Large Pub. Thus the original mission of the ITG model and the ITAC were inconsistent with the CIO's agenda. This created conflict between the CIO and ITAC related to influence and control over IT decision rights. The CIO restructured the ITAC, made changes to its activities and membership, and then terminated the coordinating effort.

Complementary Insights from the Unit-Aligning Mechanism

The original ITG model for Large Pub recognized both the need to coordinate IT investments at the enterprise level and the autonomy of units in terms of prioritizing customer IT service needs and IT spending. The model sought to ensure and reinforce alignment between the various units, including Central IT, and the enterprise goal of managing overall IT investments more effectively by sharing services and eliminating redundancy. The new CIO shifted the focus of enterprise IT management to operate through Central IT and the Office of the CIO. The primary vehicle to achieve this was using shared core services provided by Central IT as the basis for setting strategic priorities. The autonomous units generally, and the four largest units that accounted for 70 percent of the IT spending in particular, had the primary mission to provision customer and employee services. These local priorities did not necessarily utilize Central IT core services or align with the new approach to establish organizational priorities. The CIO's changes to the ITAC excluded or marginalized key participants, and did not provide a clear means for units to influence the IT strategic plan or other enterprise-level initiatives. As the CIO acknowledged when proposing a completely new ITAC body, none of the changes to the ITAC recognized the important role the units played in allocating IT resources effectively. In effect, the CIO had created a structure and environment within the coordinating effort from which the lack of unit alignment emerged.

Assuming the CIO was motivated by a desire to establish a dominant role in defining priorities and implementing enterprise IS initiatives, the question as to how this would be accomplished arises (i.e., what political means would achieve the outcome?). Even with position influence and perceived

expertise, the CIO needed to marginalize the large unit directors. The unit-aligning mechanism helps explain the effort by the CIO to redefine organizational objectives in terms of Central IT priorities and core services so as to isolate the influence of the large units. It also helps explain the failure of the reconfigured ITAC to support the CIO effectively on tactical and strategic initiatives because of the inability of the autonomous units to exert meaningful influence based on local needs and priorities, and thus withdrawing active participation. The two macro–micro explanations of power/politics and unit aligning complement each other. Whether the misalignment between the CIO/Central IT and the autonomous units was the product of specific actions and decisions on the part of the CIO, or emerged from the ITAC structure conflicting with the priority differences of the units involved, the unit-aligning mechanism provides more clarity to understand the outcomes observed.

Contributions

We have applied the principles for conducting critical realist case study research (Wynn and Williams 2012), founded on the philosophy espoused by Bhaskar (1997, 1998), to develop a causal understanding of the coordinating process in a federated IT governance structure. Through a comparative case study that leveraged deductive, inductive, and retroductive elements in a multifaceted approach to scientific logic, we have explicated two causal mechanisms—consensus making and unit aligning—that help to explain the outcomes observed in two coordinating efforts in a single, public sector organization. We identified four elements of coordinating structure and context (operating mode, composition, coordinating climate, and engagement logic) that further elaborate the traditional concept of a *coordination mechanism* by identifying its structural and contextual aspects and how these interact. Our multilevel macro–micro–macro model shows how the mechanisms and coordinating structure and context interact across levels of analysis in virtuous reinforcing or undermining ways. Together, these findings enrich our understanding of the nature of coordination mechanisms and the forces that influence the coordinating process and outcomes. They also provide complementary explanatory insights when applying alternative theoretical lenses to the process of coordinating.

Our contributions are threefold. First, traditionally, coordination research has viewed coordination from a structural arrangements perspective (e.g., coordination mechanisms) and less so as a temporally unfolding process of interrelated actions. Our study, like Faraj and Xiao's (2006, p. 1155), "emphasize[s] the temporal unfolding and situated nature of coordinative action," and, like Jarzakbowski et al.'s (2012, p. 907), views coordinating mechanisms not as "reified standards, rules and procedures" but rather as a "dynamic social practice." In addition, it contributes to this stream of research by unpacking the coordinating process into a set of specific structures, contextual influences, and emergent causal mechanisms which can be leveraged in developing new theories and perspectives on coordinating. The coordinating efforts in this study utilized the structural overlays of a standing committee and a task force and we explicated the structures, mechanisms, and context for these. Others can use our work as a starting point to look at other coordinating mechanisms. This has the promise to further enhance our understanding of coordinating at a more granular level and of how various coordination mechanisms produce outcomes in a particular organizational context.

Second, from an IT governance perspective, research views governance as the allocation of IT rights and responsibilities and examines effects of different governance arrangements on outcomes (see Weill and Ross 2004). Our research, which examines coordinating in a federated IT organizational structure, suggests that *governing* is a negotiated coordinating process that unfolds over time and that governance structures (such as the ITAC) are themselves evolving and negotiated. Thus, our study provides insights into the structures, context, and mechanisms that result in units aligning or not with organizational objectives and enhances our understanding of how governance structures and the governance coordinating process interact and shape each other. Thus, it shifts the focus from governance to the process of governing.

Finally, empirical CR research in the IS literature is small but growing. We believe this study clearly illustrates the principles of CR applied to case study research, and provides a useful template for researchers to conduct CR case studies. Ultimately, we hope it encourages others to adopt critical realism in pursuit of deeper explanations of socio-technical phenomena.

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MIS Quarterly

SPECIAL ISSUE: CRITICAL REALISM IN IS RESEARCH

CAUSAL EXPLANATION IN THE COORDINATING PROCESS: A CRITICAL REALIST CASE STUDY OF FEDERATED IT GOVERNANCE STRUCTURES

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Appendix A

Data Collection

In order to gain broad exposure to the emergent properties of the relevant structures and to counter potential biases in the research process (Wynn and Williams 2012),[1] we employed multiple data collection methods to explore the coordinating process at Large Pub. These included semi-structured interviews, passive observations, review of archival data, and informal conversations with key participants. The data collection process took place between October 2003 and January 2007. A summary of the data collected is presented in Table A1.

The primary data source was the interviews of key informants which included 24 interviews with 20 ITAC participants, and 12 interviews with 12 BPA participants all totaling 49 hours (see Tables A2 and A3). The interviews included almost all of the primary participants in both coordinating efforts. The interviews were semi-structured, starting with a standard interview guide and evolved based on participant insights and prior findings. For participants who were re-interviewed, the same basic interview guide was used with the focus on confirming prior findings and identifying changes. All interviews were conducted by the first author, and approximately one-half by both. Interviews typically lasted about 1.5 hours, and all but four were digitally recorded and transcribed verbatim. Interviews were supplemented with extensive field notes. To insure each interview accurately conveyed the participant's thoughts, each was given an electronic version of the interview transcription and asked to review for accuracy.

In addition to interviews, extensive observations were made by the authors as passive observers of regularly scheduled ITAC meetings. A total of 26 monthly ITAC meetings were observed between March 2004 and October 2006. Other observations included two multiday off-site retreats of the ITAC, two meetings held to present BPA consultant reports, several organization-wide meetings related to IT at Large Pub, and meetings of other IT coordinating bodies. Extensive field notes were taken during all observations and later electronically transcribed.

[1]This study utilized the qualitative case study method. The variety of qualitative data types and informants addresses the principle of multimethods as described by Wynn and Williams.

Table A1. Summary of Data Collected

Data Source	Number	Total Data
Semi-Structured Interviews	**36**	**49 hours**
ITAC	24	29 hours
BPA	12	15 hours
Unstructured Interviews		
Interim CIO Discussions	16	20 hours
Observations		**92 hours**
ITAC Monthly Meetings	26	52 hours
Other ITAC Meetings	5	8 hours
ITAC Retreats (4 days)	2 (4 days)	28 hours
BPA Meetings	2	4 hours
Archival Data		
ITAC	100+ documents	500-600 pages
BPA	25+ documents	100-200 pages

Table A2. ITAC Interviews

Informant	Date	Length
Interim CIO	Jun 2004[a]	62 minutes
CIO	Nov 2004 Mar 2006 Jan 2007[b]	52 minutes 75 minutes 56 minutes
ITAC Chair and major Division IT Director #1	Jun 2004 Nov 2006	95 minutes 141 minutes
Former ITAC Chair and Division IT Director #2	Nov 2004 Dec 2006	90 minutes 100 minutes
Division IT Director #3[c]	Jun 2004 Dec 2006	76 minutes 67 minutes
Public Service Sub-committee Chair #1	Sept 2004	85 minutes
Advanced Computing Sub-committee Chair #1	Sept 2004	104 minutes
Admin Sub-committee Chair #1 (and AVP HR)	Mar 2005	63 minutes
Associate CIO and ex-officio member	Jun 2005	99 minutes
Division IT Director #4	Nov 2006	104 minutes
IT Managerial Committee Rep (and Division IT Director #5)	Nov 2006	86 minutes
Former ITAC Chair and Division IT Director #6	Nov 2006	84 minutes
Public Service Sub-committee Chair #2	Nov 2006	92 minutes
Admin Sub-committee Chair #2	Dec 2006[b]	100 minutes
Advanced Computing Sub-committee Chair #2	Dec 2006	52 minutes
Senior Employee Council Representative	Dec 2006	60 minutes
Central IT Budget Director	Dec 2006	58 minutes
Technical IT Coordinating Committee Rep	Jan 2007	79 minutes
Chief Operating Officer	Jan 2007[b]	45 minutes

[a]Approximately 10 informal discussions, lasting 50 minutes on average, were held with the interim CIO from October, 2003 through June, 2004. Extensive field notes were taken during these discussions. Topics covered included the formation of the ITAC, other IT coordinating efforts, internal and external influences, and the concepts of coordinating within the federated governance model.
[b]Interview covered both ITAC and BPA.
[c]The first IT Director for this division was promoted; the second interview was his replacement.

Table A3. BPA Interviews

Informant	Date	Length
Senior Manager, Customer Information	Nov 2006	99 minutes
Vice President, Finance	Nov 2006	80 minutes
Director, Data Analysis and Reporting	Dec 2006	87 minutes
HR Director	Dec 2006	100 minutes
Director, Customer Accounts	Dec 2006	77 minutes
Director for Planning	Dec 2006	62 minutes
Central IT Budget Director	Dec 2006	54 minutes
Associate Chief Operations Officer	Dec 2006	78 minutes
Vice President, Human Resources	Dec 2006	86 minutes
Controller	Dec 2006	92 minutes
Chief Operating Officer	Jan 2007	45 minutes
CIO	Jan 2007	56 minutes

Appendix B

Final Code Categories

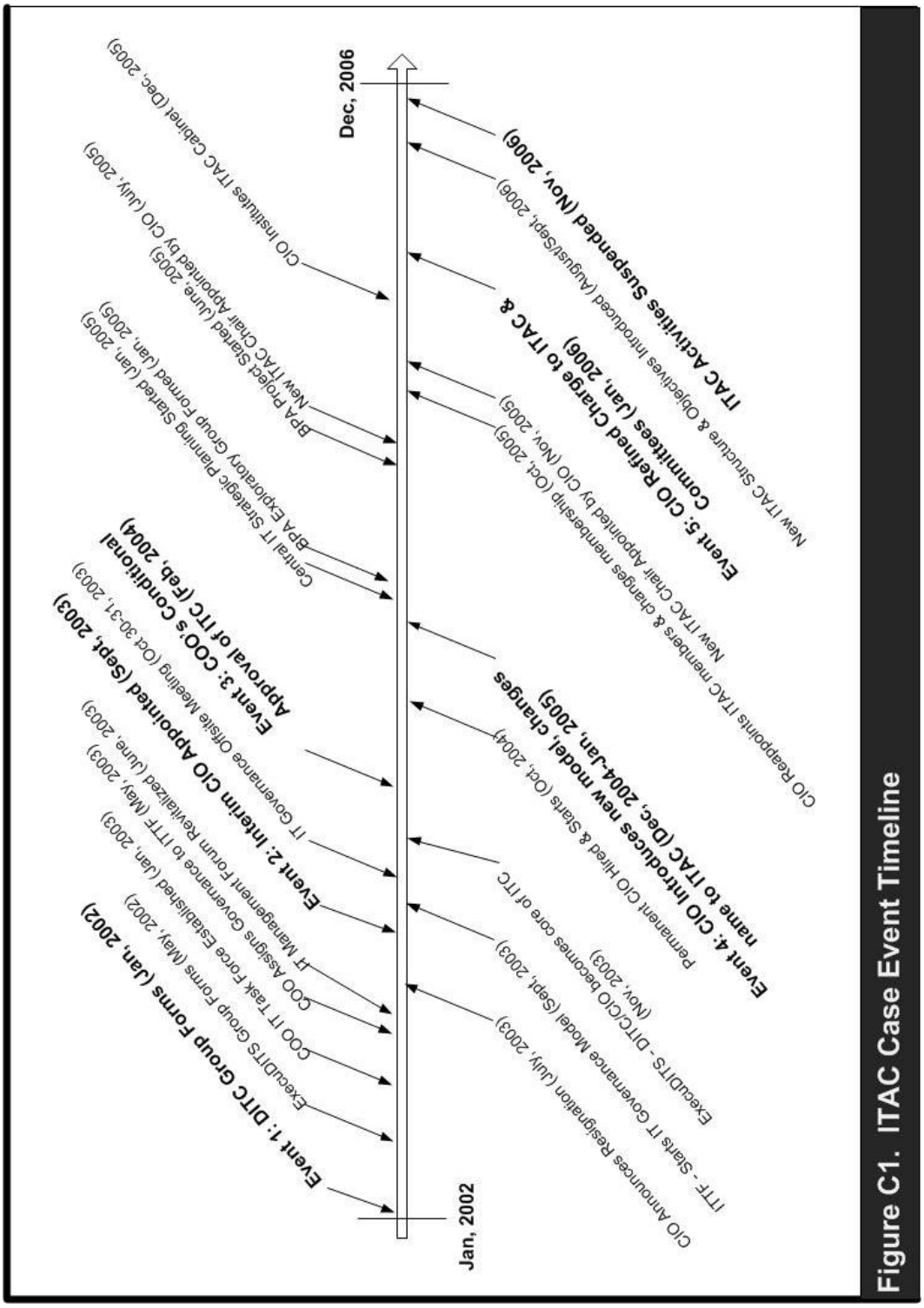
Category	Meaning	Sample Codes in Category
Coordination Mechanism – Formal	Groups created formally with specific coordinating or oversight objectives	Standing Committee Task Force
Coordination Mechanism – Informal	Non-structural activities to create interpersonal relationships	Direct Contact Networks
Operating Mode	Bases for fulfilling the objectives of a coordinating effort	Clarity of Purpose Plan & Method Defined Outputs Accountability
Engagement Logic	Influences that impact level of engagement from participants in a coordinating effort	Relevance Importance Action Oriented Impact
Coordinating Climate	Contextual attributes which influence the efficacy and outcomes of a specific coordinating effort	Leadership Executive Involvement Trust Open Communications
Composition	Attributes of the general composition and specific actors in a coordinating effort	Representation Size Status Unit Support
Purpose – Consensus	Align effort participants and larger organizational constituencies to support and implement specific initiatives	Build Consensus Exert Influence
Purpose – Managing Relationships	Establish and maintain networks of relationships across organization units	Communication Building Relationships
Purpose – IT Context	Specific domain of the creation, implementation and use of information technology to fulfill business and operational objectives	Common Infrastructure Data Integration Shared Software Information Security Knowledge Sharing
Purpose – Strategic Direction	Efforts to establish the IT strategic direction and to align IT strategy with overall organization strategy	Strategic Planning Resource Allocation
Inner Context	Inner mosaic of the organization	Culture Local Setting
Outer Context	Aspects of the environment external to the organization	Economic Legal/Political Technological
Politics	Organizational conditions in which decision making is likely to involve power and influence tactics	Power Sources Power Determinants Conditions for Use

Reliability was established for the codes and coding process using inter-rater assessment (Boyatzis 1998; Miles and Huberman 1994). A colleague familiar with qualitative data analysis but not associated with the research project was given the coding template, a summary of the research project and a brief description of the two cases. This material was discussed and all initial questions answered. The colleague and researchers separately coded large segments of the same transcribed interviews (representing approximately 30 minutes of an interview) for both the ITAC and BPA cases. The results were compared and any discrepancies discussed until consensus was established on the appropriate code. After three rounds based on three different interview segments, a total match percentage[2] of over 83 percent was achieved. This provides strong support for the reliability of the data coding and is consistent with existing IS research (Lapointe and Rivard 2005).

[2]Total match % = (# of matches / (# of matches + # of mismatches)).

Appendix C

Event Time Lines



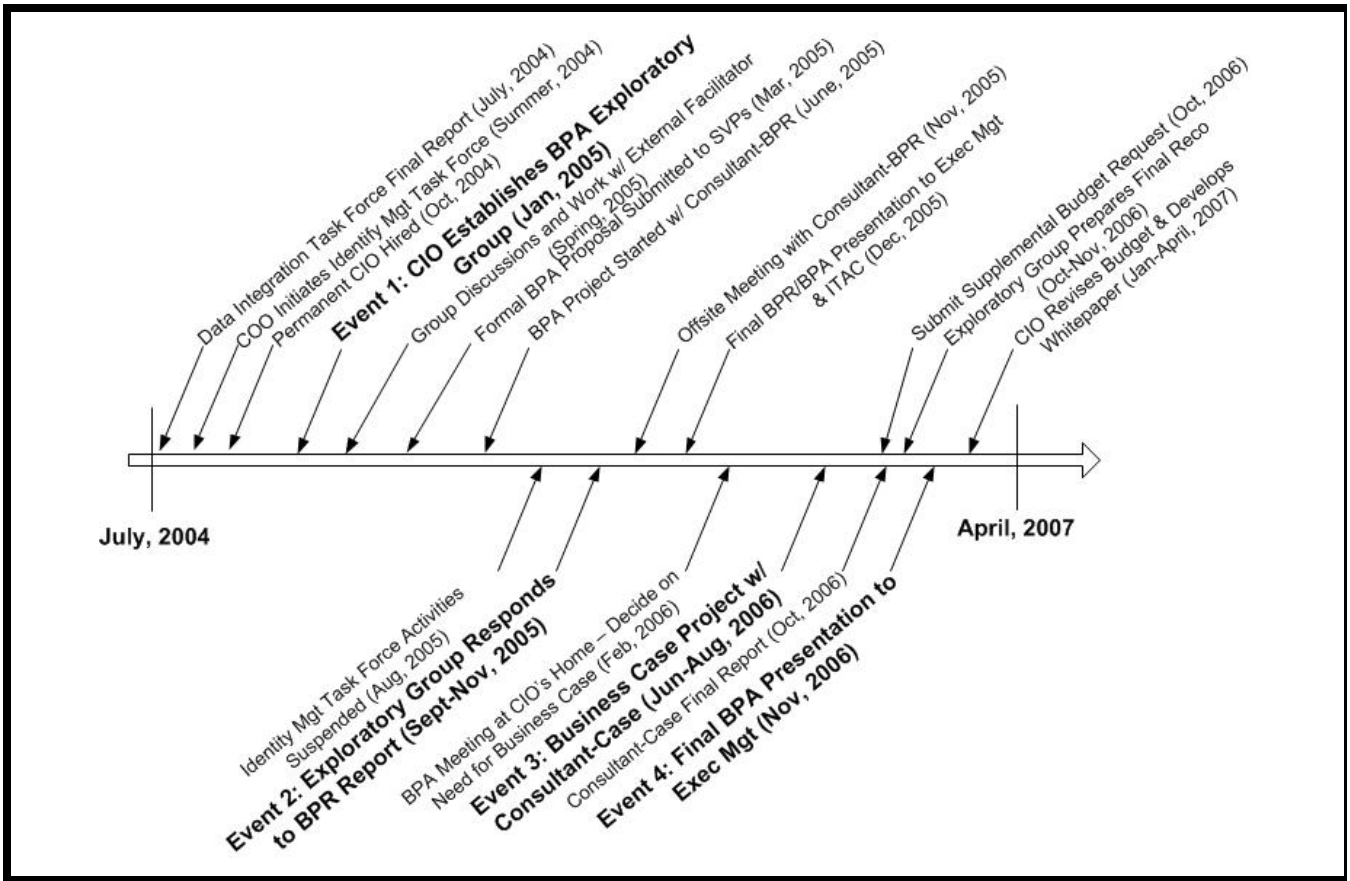
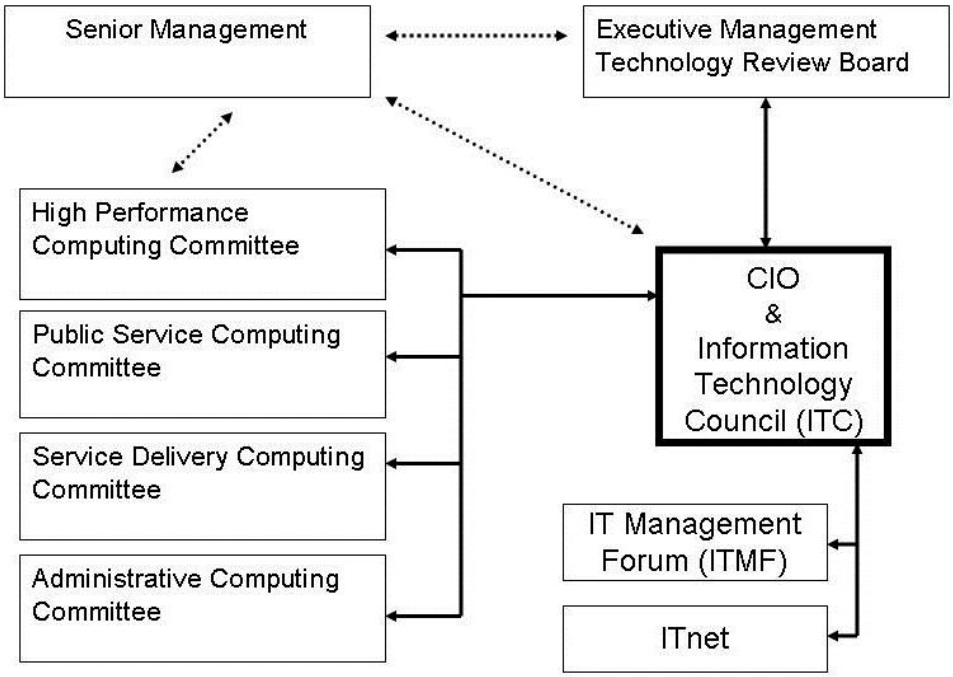


Figure C2. BPA Coordinating Event Time Line

Appendix D

Large Pub Proposed Governance Model



Appendix E

Empirical Corroboration

We sought corroboration of the hypothesized mechanisms in several ways: multiple participants, repeated confirmations over time and through multiple events, identification of other expected experiences, and multiple cases.

Data collection and analysis for this study took place over an extended period of time and involved nearly all key participants in both coordinating efforts. The participants were given the opportunity to review and comment on all interviews and preliminary findings. As important events and aspects of structure were identified and explicated, these were tested through subsequent interviews. Additionally, the analysis included explicit cross-case comparisons to confirm aspects of structure and the contextual environment and the role of the mechanisms in determining the observed events and outcomes.

The event-level analysis provides additional confirmation of the presence and influence of the mechanisms in two ways. First, through our descriptions of the mechanisms, the causal impact is demonstrated for multiple events and the ultimate outcomes for both the ITAC and BPA cases. For example, in the BPA case, we see the impact of consensus making first driving the tentative agreement for pursuing the business process review (BPA Event 2) and then the near breakdown of consensus and group function in the preparation and delivery of the final presentation (BPA Event 5). In the ITAC case, unit aligning was the dominant influence leading to the informal networking of the DITC group (Event 1) in order to improve spending effectiveness and service enhancements at the unit level in a resource scarce environment. The unit-aligning mechanism is also clearly evident in the failures of both attempts by the CIO (ITAC Events 4 and 5) to create a method of advice and advocacy on enterprise IT initiatives.

The second way that the event analysis provides corroboration of the mechanisms is to use the concepts of summative validity (Lee and Hubona 2009) to assess the mechanism by confirming other related events or activities that we would expect to see if a mechanism is present and activated (Wynn and Williams 2012). Within the BPA coordinating effort, for example, we see confirming support for the unit-aligning mechanism. The effort to develop a consensus recommendation was severely impacted by the lack of alignment from Finance. The perceived costs to the Finance area were too high in terms of changing highly customized business processes in order to implement a commercial off-the-shelf (COTS) solution that would better support organizational goals.

If the unit-aligning mechanism exists, and was at work in the coordinating effort, we would expect to see other functional areas converging on the enterprise-level objectives of Large Pub even if these conflicted at some level with functional unit needs and priorities. This happened in at least two areas. In the customer finance area, the existing systems satisfied the vast majority of its needs and conversion to a new packaged software solution would require major realignment of responsibilities across departments, and recreating a key system to support a special customer financing program (Director Customer Accounts, 12/06). In the Human Resources area, the lack of support from the legacy systems was widely recognized and the need for a new software solution was clear. Even with this need, the vice president of HR preferred to delay implementation in this area so as not to fully absorb staff bandwidth during an on-going effort to create sophisticated new services for Large Pub employees. However, both managers recognized the overall benefits to Large Pub and unequivocally supported full implementation of the single-vendor COTS solution to achieve data integration.

References

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