

December 2006

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Recommended Citation

Williams, Clay, "Coordination as a Process for Federated IS Governance" (2006). *AMCIS 2006 Proceedings*. 538.
<http://aisel.aisnet.org/amcis2006/538>

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Coordination as a Process for Federated IS Governance

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ABSTRACT

Federated information systems (IS) governance structures are becoming more prevalent as multi-unit organizations seek to balance the competing demands of autonomy for business units to respond to local needs and synergies gained from common infrastructures and boundary spanning software systems. Coordination of the development, use, support and management of information technology is critical to successful governance. Prior coordination research has focused primarily on the efficacy of particular mechanisms in creating effective lateral relationships. To achieve the full benefits of federated IS governance, coordination is conceptualized as a process involving a portfolio of coordination mechanisms, employed over time, to achieve a collaborative enterprise outcome. This dissertation adopts the critical realist perspective in a longitudinal case study of a large, public institution to inductively generate process theory of how coordination occurs in a federated IS structure.

Keywords

Coordination, process theory, federated governance, critical realism

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 are seeking efficiencies from information technology (IT) and systems (IS) leading to standardized IT infrastructures (Broadbent, Weill and St. Clair, 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 IS governance (Scott, Holub and Pultz, 2006) wherein IT infrastructure is managed centrally and systems development is decentralized (Brown, 1999; Sambamurthy and Zmud, 1999).

While balancing tensions between autonomy and synergy, federated governance also creates structural barriers to alignment between the central and unit IS groups (Brown, 1999). Decision-making and reporting relationships split between central IS and business unit management responsible for the unit-level IS function inhibit communication and collaboration between central and unit IS managers (Brown, 1999). The lack of coordination in the federated IS governance 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. Specific coordination efforts are required to prohibit these problems, to overcome the barriers to alignment and to realize the desired organizational performance objectives in federated IS structures (Brown, 1999).

An example familiar to the author from the public sector demonstrates the nature and challenges of coordination in the federated governance structure. A state agency is responsible for over two dozen autonomous units located throughout the state. The units deliver a variety of similar services to the public, focus on certain geographic areas and specialize in certain functions and industries. The units offer some overlapping services and frequently draw from similar customer populations.

The state agency desired to manage the enterprise more effectively through consolidated planning, measurement and reporting; to improve efficiency through shared services; to improve delivery at the point of service; and to provide the opportunity to each autonomous unit to tailor services to their specific market needs while supporting the other enterprise objectives. To achieve these objectives the agency mandated that a common enterprise software system should be deployed by all its units. This common system consists of two software products that when integrated provide full financial, operational, and human resource management functionality.

The software products to be used were specified and a variety of network and infrastructure services were provided by the IS unit of the central state agency. The agency provided additional funding support, general guidance, product expertise and training for the implementations. For one software product, the implementation was rigorously centralized with all aspects of the configuration established and controlled by the central agency, including hosting of system data. No customizations were permitted to satisfy local needs, only changes that were applied to all units. However for the second product, each individual implementation project was managed by the unit and with responsibility typically given to each unit's IS department. Very little coordination occurred between the autonomous units. Over time the units did develop mechanisms for sharing information regarding the software products, issues with implementation, business process challenges, and modifications required to achieve desired results. Very little was done by the state agency or the central IS unit to coordinate how the units would use the second software, the business processes required to support the enterprise goals or the way in which the software system was implemented.

The net result of the state agency's initiative is that even though common software products are being used in almost all units, the implementations are unique to each unit. In effect the state agency is faced with having almost completely different "systems" at each unit. This is largely due to the lack of proactive and comprehensive coordination between the central IS unit and each individual unit as well as between the various autonomous units. The use of identical software products does provide some inherent "commonality". But the lack of coordination in defining business processes to be supported, implementing the software, identifying the nature and types of customizations that should be implemented as well as those that should not, and using the software system in an on-going basis has substantially limited the ability of the state agency to fulfill its original objectives. The financial and performance results of this effort have been disappointing for both the individual units and the state agency to the point that a completely new IS solution is being considered.

Coordination is a central concept in organizational design theory (e.g. Galbraith, 1973; Lawrence and Lorsch, 1967; Thompson, 1967) and has been studied by IS and management scholars focusing on the management of uncertainty and interdependency through the creation of lateral relations between organizational units. Prior IS research has focused primarily on assessing the efficacy of various coordination mechanisms in a variety of organizational contexts as demonstrated in Brown's (1999) literature review. Other recent work has addressed coordination in terms of mechanisms employed for intra-and inter-organizational relational networks (Gittell, 2002), knowledge sharing and boundary spanning (Kellogg, Orlikowski and Yates, 2006; Pawlowski and Robey, 2004; Tanriverdi, 2005), and IS implementations (Sabherwal, 2003).

The challenges inherent to the federated IS structure cannot be addressed through the implementation of individual coordination mechanisms. Rather, a more comprehensive approach is required to establish effective lateral relations between various organizational units through the management of coordination as an organizational process that evolves over time in response to changing conditions.

RESEARCH QUESTIONS

While coordination has been defined as a process for managing dependencies within organizations to achieve desired outcomes (Malone and Crowston, 1994; Quinn and Dutton, 2005) and a few studies have approached the coordination problem from a process perspective (e.g., Galbraith, 1994; Garvin, 1998; Kellogg et al., 2006; Sambamurthy and Zmud, 2000), only a few empirical studies in IS have specifically investigated the process of coordination (e.g. Peppard, 2001; Schwarz and Hirschheim, 2003).

To add to our understanding of the process of coordination, the current research frames coordination as a process involving: (a) a portfolio of coordination mechanisms that are (b) employed over time within an organizational context and (c) influenced by interacting social, political and environmental forces, in an effort to achieve an enterprise, collaborative outcome. Since prior research offers little guidance on how the process of coordination unfolds over time, this research will adopt a longitudinal case study to inductively generate theory of coordination as an organizational process within the federated IS governance structure. Specifically, this dissertation addresses the following questions that will be investigated longitudinally:

- What is the process by which coordination occurs over time within a federated IS structure?
- What are the contextual factors that influence the coordination process?

RESEARCH METHODS

This research adopts the philosophy of critical realism which makes the ontological assumption that the world is real and exists independently of our ability to experience it and the epistemological assumption that our knowledge is historically and

socially constructed and thus inherently subjective (Bhaskar, 1978; Mingers, 2004; Pawson and Tilley, 1997; Reed, 2005; Tsoukas, 1989). In federated IS structures the coordination process involves the sequence of collaborative activities or efforts to achieve collaboration between units targeted towards improved organization deployment, use and management of IS resources and capabilities. The focus of this dissertation is to inductively create process theory (Markus and Robey, 1988; Mohr, 1982) which identifies the causal mechanisms that explain how the coordination events and contingency factors combine to produce the observed outcomes.

The case study methodology is commonly recommended for the study of process phenomenon (Langley, 1999; Van de Ven and Poole, 1995; Van de Ven and Poole, 2005) and for the realist perspective (Mingers, 2004; Reed, 2005; Tsoukas, 1989). To address the research questions related to the coordination process in federated IS structures an inductive case study method is an appropriate choice. This study will be guided primarily by accepted approaches to building theory from and assessing the quality of case research (Eisenhardt, 1989; Leininger, 1994).

The research site, known by the pseudonym LargePub, is a public institution located in the southern United States with an annual budget exceeding \$1.1 billion, and over 10,000 employees. LargePub offers similar services through 15 major sub-units to over 32,000 customers. LargePub is organized following a federated IS governance model with the central IT organization responsible for the core network infrastructure and enterprise applications, and sub-units responsible for local networking and hardware infrastructure, end-user support, and for sub-unit specific application development needs.

The data will be generated from the study of two “coordination efforts” at LargePub. A coordination effort is defined as a series of cohesive activities undertaken to achieve a specific, desired outcome that requires collaborative effort. Data collection will have taken place over a period of 2.5 years. The primary methods include semi-structured interviews, observations, and review of archival data.

Data analysis will be conducted using accepted qualitative techniques (Eisenhardt, 1989; Miles and Huberman, 1994; Pettigrew, 1990). The focus is on longitudinal analysis for the ITAC and BPA coordination efforts. Prior literature relevant to coordination will inform data analysis and the coding will generally follow a stratified approach (Strauss and Corbin, 1998) to generate increasingly abstracted connections in the data through which the underlying mechanisms and contextual factors impacting the empirical events of the coordination process will be exposed.

The results of the data coding combined with narrative descriptions and detailed coordination timelines can be combined inductively to generate a number of different forms of process theory output. The data collection and analysis strategy provide the foundation to generate the substantive process theory related to coordination in federated IT governance structures, and the nature of this process theory will emerge as this study unfolds.

CONTRIBUTIONS

The proposed study of the coordination process in a federated IS governance structure offers a number of contributions to both theory and practice. Prior research has focused on assessing the impacts of various coordination mechanisms in different IT governance structures and related to achieving specific IS objectives (e.g. boundary spanning, software development, strategic planning, knowledge sharing, etc.). This research seeks to advance our understanding by generating theory of coordination as an organizational process in a federated governance structure. Further this research seeks to explicate how various coordination mechanisms, events and contextual factors impact this process and shape organizational level coordination outcomes.

Further, very little research has been published in the IS literature which explicitly claims a realist perspective (e.g. Kirsch, 2004) to the point of being almost invisible (Carlsson, 2003). This research seeks to generate substantive theory answering “how” and “why” questions, the core of the realist orientation, related to the coordination process by rigorously applying accepted qualitative methods and adhering to the precepts of critical realism. This offers the potential to introduce new research methods for IS researchers.

Practitioners have gained from prior research on coordination mechanisms and the ideas of coordination theory applied to managing processes of interdependent tasks (Malone and Crowston, 1994). The federated IS governance structure is utilized by many organizations today. This structure places greater emphasis on the need to coordinate the development and use of IT/IS infrastructure and software systems across organizational units. Yet the challenges of federated governance are significant and the practitioner literature is replete with stories of lack of value generated from IT investments, IS incapable of supporting business strategies, and dissatisfied users. This research seeks to establish an understanding of coordination as an enterprise process and provide guidance to managers on the organizational structures, causal processes, sequencing of activities and contextual factors that drive enterprise coordination outcomes and impact process effectiveness.

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