Bundling and Unbundling Tasks in an ERP Acquisition Transaction: An Analysis of Asset Acquisition Incentives

Completed Research Paper

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ABSTRACT

The market for the corporate acquisition of Enterprise Resource Planning (ERP) systems was estimated at $45.5 billion in 2011. Failure of these transactions is a continuing issue for both business and researchers. As the system acquisitions and transactions that govern them grow increasingly complex, a better understanding of the transactions and how to govern them is imperative. This study begins the examination of such transactions through the lens of Incentive-System Theory, an extension of Transaction Cost Economics Theory. A case study was conducted at a large (several hundred outlets) retailer/distributor in the US currently engaged in the acquisition of an ERP through a major ERP vendor. The initial findings suggest Incentive-System Theory is a viable lens and one that may suggest improvements in the way such transactions are structured. Limitations and paths for future research to extend the theory and its application are discussed.

Keywords
 Transaction Cost Economics, Incentive-System Theory, Enterprise Systems Acquisitions, ERP.

INTRODUCTION

The trend in acquiring complex assets and engaging in the associated complex transactions has seen a dramatic increase with the advent of enterprise-level information systems such as: Enterprise Resource Planning (ERP), Customer Relationship Management (CRM), Supply Chain Management (SCM), etc. (collectively referred to as Enterprise Systems (ES) hereafter). Such investments in IT systems are found to have a substantial role in the overall strategy of the organization (Drnevich and Croson 2012). Despite the fact that systems of this scope were once considered too complex to be acquired from outside the firm (Dearden 1972), the market for the corporate acquisition of ERP systems alone was estimated at $45.5 billion in 2011 (Forrester 2011). The sheer scope of economic activity surrounding the development and acquisition of ES indicates that transaction failure is a significant issue. A recent listing of ERP system acquisitions that suffered failure shows the magnitude of the problem (Kanaracus 2011). Further, failure of these transactions is not a recent phenomenon (White et al. 1997). The fact that ES acquisition transactions are commonly executed unsuccessfully is shown by: 1) the post hoc legal activities of the parties to the transaction (Holland and Light 1999; Koh et al. 2008), and 2) the wide variety of Information Systems (IS) research into causes of acquisition transaction failure (Brown 1997; Keil and Flatto 1999; Keil et al. 2003; Mähring and Keil 2008; Sambamurthy and Zmud 1999; Xue et al. 2008).

The advent of "business functions as a service" providers such as salesforce.com for customer management and google.com for communications support is viewed as making outsourcing ever more viable (Hayes 2008). Firms have additional motivation to outsource "non-core" functions (IT in many cases) to other corporations (Christiansen 2013) to avoid the problems of "large" business (the article particularly highlights "ObamaCare" and its 50-person limit on firm size before certain rules are applied). With over one-fifth of the US workforce not under traditional employment contracts (Cappelli and Keller 2012), firms’ ability to successfully govern relatively small transactions may increasingly determine success in the market.

Many strategy theorists utilize Transaction Cost Economics (Williamson 1979; Williamson 2010, TCE hereafter) as a theoretical lens for transaction governance analysis (for an extensive review, see Macher & Richman, 2008) and IS scholars have followed suit (see reviews in Dibbern, Goles, Hirschheim, & Jayatilaka, 2004; Hirschheim & Lacity, 2000; Lee, Huynh,
Kwok, & Pi, 2003). But recently, Lacity, Willcocks, and Khan (2011) argue that TCE is insufficient as a theory to describe the IT outsourcing phenomenon. Nevertheless, a recent contribution to TCE theory, Incentive-System Theory (Makadok and Coff 2009, IST hereafter) develops a formal theory of synergies between task incentives to determine which transaction governance form is most efficient for a given set of tasks that comprise a transaction. Therefore, this research addresses the question: how do we utilize the theories of transaction governance to support selection of efficient governance forms for ES transactions based on the properties of the transaction and the tasks that comprise it?

In order to answer this question we utilize IST to analyze an ongoing IS asset acquisition transaction. The facts of the analysis are developed through case study. We identify the tasks that will be carried out to complete the acquisition transaction, analyze incentive synergies between those tasks, and then match the theoretical governance form with the incentive synergy pattern. We then draw conclusions regarding the applicability of the theory as an analysis tool and suggest future research.

THEORETICAL BACKGROUND

IT acquisition transactions

The acquisition of an IT asset can be modeled as an exchange transaction between two firms. The buying firm seeks to acquire a system that meets its specific needs; the selling firm has already developed a generic system that can be modified to suit the buyer (Swan et al. 1999; Wagner and Newell 2004). The amount of modification varies, but is often significant (Gattiker and Goodhue 2005). The success rates of IT asset acquisition transactions is low (Huigang et al. 2007) due in part to high levels of risk (Keil et al. 2008; Keil et al. 2000; Raz et al. 2002; Tah and Carr 2000). Acquisitions of information systems are infrequent, uncertain, and highly specific transactions, in the sense that little of the customization effort is usable in transactions with other clients (Wang et al. 1997).

Transaction cost economics (TCE)

TCE is a popular and widely applied theory of transaction management and governance in the strategic management literature (Bensaou and Anderson 1999; Brouthers and Brouthers 2000; Mayer and Salomon 2006; Nickerson and Silverman 2003) and in the IS outsourcing literature (Dibbern et al. 2004; Klein 2002; Lacity et al. 2010).

Simply put, the contractual approach [TCE] tries to explain how trading partners choose, from the set of feasible institutional alternatives, the arrangement that best mitigates the relevant contractual hazards at least cost. (Klein 2010, p. 167)

The wide use of TCE may be based on its flexibility in allowing analysis of many kinds of transaction governance arrangements beyond the market-based buying of assets under contract and the firm-based making of assets within the organization (David and Han 2004). In particular, TCE supports the notion of hybrid governance forms; these are forms of transaction management which are neither purely market-based nor purely internal to the organization (Williamson 1991). However, disputes regarding TCE’s normative applicability, effectiveness, and level of empirical support are ongoing and inconclusive, not only in the strategy literature (Carter and Hodgson 2006; Combs et al. 2010; David and Han 2004; Geyskens et al. 2006), but also in the IS literature (Alaghehband et al. 2011; Lacity et al. 2011). Specifically, TCE has been criticized as offering only a simple view of ownership of the firm (Kim and Mahoney 2005), as relying on the assumption that transaction costs and hold-up problems are reduced within hierarchies (Hart 1995), and as not being robust enough to address the complexities of IS outsourcing transactions (Lacity et al. 2011).

The Incentive-System Theory (IST)

Recently, research extended TCE into complex ownership scenarios in hybrid governance forms (Makadok and Coff 2009). This formulation categorizes hybrid forms according to three principal dimensions of difference between markets and hierarchies: the ownership of the assets used to deliver the transaction result, the productivity incentives for the agent, and the level of authority the principal is able to exert over the agent’s behaviors. This study finds that much of the research on “hybrid” forms is actually studying “intermediate” forms (see Figure 1) in which the three dimensions vary, but vary together. IST then proposes that the dimensions can vary independently and defines hybrid governance arrangements according to their differences on the dimensions. This definition results in example hybrid forms that may differ from a prototypical market/hierarchy form only on one or two dimensions as compared to varying in intensity on all three at the same time.
The Incentive-System theory presents an example transaction from the automotive industry (Makadok and Coff 2009). It defines the production task as the creation of the product to be supplied to the principal, automobile components in the example. The asset maintenance task is the continued improvement of the reputation of the supplier through on time delivery and sound design services. The personal activities task is internal process improvements and maintenance of private cost data. The leverless task is cooperation with other suppliers in the design and delivery of the supplier's product (Makadok and Coff 2009).

As we develop general definitions of the four task types below, we will consider the underlying ideas of value and cost, and how the agent is rewarded. Such an analysis will then be used to define tasks with the same properties within our ES transaction case. We summarize the generalized definitions in Table 1, below.

1 The efficient governance forms are indicated as in the figure by the combination of the synergy pattern and high importance of the leverless task. For further detail, see Makadok and Coff (2009).
The production task encompasses the work that the agent performs to create a product that is valuable to the principal, but not necessarily directly valuable to the agent. The principal therefore does not typically reward the agent in kind, but in other ways, typically financial. Therefore, we generalize the production task as that task which the agent performs to produce value for the principal, and for which the agent is directly rewarded or paid.

The asset maintenance task involves a change in value of the primary productive assets in the transaction (Makadok and Coff 2009). The value of the asset maintenance task is based on the combination of positive change in the asset value coupled with some non-zero share of ownership held by the agent. The asset maintenance task is generalized to a task that the agent performs which improves the value of an asset that benefits both the agent and the principal.

The personal activities task is any task that has value to the agent but not to the principal. A mundane example is an employee engaging in some hobby during working hours or performing some errand while on company business. The generalized definition of the personal activities task is a task that the agent performs that only has value to the agent.

The leverless task is any task to be performed by the agent that has value to the principal, but cannot be directly motivated. This task illustrates the core of the Incentive-system theory in that it is only motivated by synergies with the other tasks. We generalize this task definition to a task that the agent performs that has noncontractible benefits to the principal and no value to the agent.

With the generalized definitions in hand (see Table 1), we can proceed to define a task for each category in the context of an ES transaction. The precise nature of each type of task can vary between transactions even if they are in the same general domain. In the analysis section below we will derive our case-specific tasks from the generic definitions derived here.

**METHODOLOGY**

At this stage of the research our questions are imprecise and we lack specific constructs for measuring the variables, therefore we chose a case study method (Bonoma 1985).

Using the case as a background, we utilize Incentive-system theory to analyze an actual ES transaction. We proceed as follows: introduce the case, observe general characteristics of the governance form used, define transaction tasks and synergies between them, and use the synergy pattern to determine the efficient governance form.

**Case outline**

The subject firm for the cases in our study is a large (several hundred outlets) retailer/distributor in the US. At the time of our initial interviews, there were several large transactions underway, one of which was the acquisition of an Enterprise Resource Planning (ERP) system. Multiple semi-structured interviews were conducted regarding this transaction. The interview subjects included several employees of the IT function within the firm at various levels of the organization and the ranking IT executive. The interviews took place over two days in late 2011 and included open-ended questions and discussion of the governance arrangement and the primary goals for the transaction.

The purpose of the transaction is the acquisition of an ERP system from a large ERP vendor and includes the customization and implementation of the ERP system. The system will integrate the various functions of the four major divisions of the firm. The transaction is planned to continue for 2-3 years, at which time the system will be considered implemented and transitioned to a maintenance phase. This case was selected based on the sizable scope and infrequent nature of the transaction. The firm was selected because it was engaged in an ERP transaction.

Our interviews revealed that the subject firm was concerned with the amount and quality of knowledge transfer from the vendor. The firm felt that their ownership of this knowledge would be a critical asset when they took over maintenance of the system, but could not find a means of ensuring that the vendor put forth the requisite effort on this task. The task was in the contract for the transaction, but the quality of the deliverable and the amount of knowledge needed was difficult to measure, thus the vendor’s motivation to perform this task at the highest level appeared to be weak. For these reasons, we defined knowledge transfer as the leverless task in this transaction.

**Definitions of transaction tasks**

Based on the generic definitions of tasks from the theory, we derived the following definitions for each task category in the case transaction (see Table 1). For the asset maintenance task, we note that the productive assets in the transaction are the base ES to be customized and the vendor’s understanding of the principal’s business processes.
Table 1. IST Example, Generalized, and Case Specific Task Definitions

<table>
<thead>
<tr>
<th>Task</th>
<th>IST example</th>
<th>Generalized definition</th>
<th>Definition of task in ERP transaction case</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production</td>
<td>Product delivery</td>
<td>A task that produces value for the principal who then tangibly rewards the agent</td>
<td>The development of a set of customizations of an existing IT system that provide use value to the principal</td>
</tr>
<tr>
<td>Asset maintenance</td>
<td>Design quality and timely delivery</td>
<td>A task that increases the value of some asset which is owned in some proportion by both the agent and the principal</td>
<td>Improvement of system development knowledge; increasing understanding of principal’s business processes</td>
</tr>
<tr>
<td>Personal activities</td>
<td>Process improvements</td>
<td>A task that has value for the agent but not for the principal</td>
<td>Customization for other clients; development of software not used by the principal</td>
</tr>
<tr>
<td>Leverless task</td>
<td>Cooperation between suppliers</td>
<td>A task that has value for the principal, but not for the agent</td>
<td>Knowledge transfer to the principal</td>
</tr>
</tbody>
</table>

Task synergy analysis

The IST relies on synergies between tasks to motivate the agent to make an effort on the leverless task. The synergies are task dependent, so synergies and countersynergies vary from transaction to transaction and among task pairs. The synergies are symmetrical; so among four tasks, there are six possible pairs, each of which is synergistic or countersynergistic. The remainder of this section analyzes these pairings for synergy and is summarized in Table 2.

Production and asset maintenance – synergistic. In transactions where the productive assets are tangible, asset maintenance is often countersynergistic with production because production causes the asset to wear out or maintenance involves some loss of use time of the asset. However, in this case, since the productive assets are intangible, production increases the vendor’s knowledge of the client processes, another productive asset. Therefore, we find the tasks to be synergistic.

Production and leverless task – countersynergistic. We find these tasks to be countersynergistic because the sharing of the vendor’s knowledge uses the vendor’s time and is a distraction from production.

Production and personal activities – countersynergistic. In some transactions, production activities could be synergistic with personal activities due to economies of scale. The specificity of ES customizations limits their transferability between clients, thus we find these tasks to be countersynergistic.

Asset maintenance and leverless task – countersynergistic. We find that these tasks are countersynergistic because knowledge is not shared between the tasks and performing the knowledge transfer task takes time away from asset maintenance.

Asset maintenance and personal activities – countersynergistic. Like the production task, the asset maintenance task has little to do with specific customizations for other clients; therefore, we find the tasks to be countersynergistic.

Leverless task and personal activities – countersynergistic. Development of customizations specific to another client is inconsistent with both the knowledge set and the time and effort required to transfer the vendor’s knowledge, therefore the tasks are countersynergistic.
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Synergy pattern & Task pair & Efficient governance form (leverless task importance is high) 
--- & --- & --- & --- & --- & --- & --- & Hierarchy  
--- & --- & --- & --- & --- & --- & --- & Empowerment  
--- & --- & --- & --- & --- & --- & --- & Quasi-integration  
--- & --- & --- & --- & --- & --- & --- & Consortium  
--- & --- & --- & --- & --- & --- & --- & Piece-rate employment  
--- & --- & --- & --- & --- & --- & --- & Autonomous profit center  
--- & --- & --- & --- & --- & --- & --- & Franchising  
--- & --- & --- & --- & --- & --- & --- & Market  
--- & --- & --- & --- & --- & --- & --- & Hierarchy*  

<table>
<thead>
<tr>
<th>Synergy pattern</th>
<th>Efficiency Governance form</th>
<th>Task pair</th>
<th>Efficient governance form (leverless task importance is high)</th>
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<tr>
<td>SP1</td>
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Note: “+” = synergistic; “-” = countersynergistic; * The pattern from the case most closely matches SP1.

Table 2. ERP Task Synergy Patterns and Analysis Results

DISCUSSION

The empirical purpose of the Incentive-system model is to determine the efficient form of governance for a given transaction through analysis of the synergies and countersynergies between tasks, along with the relative importance of the leverless task. The result of this analysis is a synergy pattern which indicates which governance form is theoretically most efficient. In our analysis, we see that the tasks in the transaction demonstrated a synergy and countersynergy pattern that is not associated with a synergy pattern identified in IST. This result confirms that the eight synergy patterns defined in IST represent a small percentage of the 64 possible synergy patterns resulting from synergy or countersynergy in six task pairs.

The IST synergy pattern that was closest to the synergy pattern resulting from our analysis is the “fully countersynergistic” pattern. This pattern indicates that high importance of the leverless task, knowledge transfer in our case, moves the efficient governance form closer to hierarchical governance. A finding that the transaction should be performed within the hierarchy means that the principal should move in the direction of integrating with the producers by, for example, hiring them as employees. The intuition here is that if the producers were employees, the leverless task of “knowledge transfer” would no longer be needed by the principal and could conceivably be replaced by an important leverless task that was more synergistic with the other tasks. Nevertheless, our finding from the case is that the properties of the transaction do not perfectly support the use of a governance form defined in IST.

Our finding illustrates an important attribute of transactions that may be useful for governance analysis: transactions are bundles of tasks, often combined for reasons other than efficient transaction completion. In the analyzed case, knowledge transfer is a task in the transaction as agreed by the principal and agent, but we note that there is no particular requirement that the knowledge transfer take place within the system development transaction. The knowledge transfer task could be removed from this transaction and combined with other tasks in a different transaction or encapsulated within its own transaction. In fact, one of the defined synergy patterns in the theory shows the leverless task to be synergistic with all other tasks, leading to a pure market governance form. A transaction could be created by the principal in such a way as to utilize this efficiency.

LIMITATIONS

We note that our conclusions are limited by the following factors in our research:
We study a single case, which means our result is not necessarily generalizable. We feel that the state of the theory and its constructs is such that a semantically rich treatment is necessary and will provide data for definition of constructs and a more rigorous empirical treatment in the future.

We found synergy in one task pair which defeated an exact match to a known synergy pattern; at present, the theory does not measure the impact of the single synergy mismatch, so we surmise that the governance form indicated by the “nearest” synergy pattern will be the most efficient. For this reason, we have not yet extended our finding to any general recommendation on the governance of IS asset acquisition tasks. Future research should assess the sensitivity of the efficiency of a governance form to a precise match with a known synergy pattern.

CONTRIBUTIONS

This research contributes to theory development and practice in several ways:

We applied IST to an IS asset acquisition transaction. To our knowledge, this is the first time the theory has been applied in an IS context. ES acquisitions are often difficult transactions and our hope is that continued IS research into the application of IST will contribute meaningful input that improves transaction outcomes for practitioners.

We illustrated that, while the applicability of TCE to the analysis of IT outsourcing may be debatable, the most recent extensions of transaction incentive theory appear to be applicable. In this sense, the finding that our case did not fit a predefined synergy pattern in the IST supports the proposition that IS acquisition transactions may not fit into the box of traditional hybrid governance forms derived from our global experience with other transaction types. In this way, our finding is an appeal for further research and optimism on finding some keys to governing these complex transactions.

As there is nothing theoretically unique about IT asset acquisition transactions, this research also contributes to the understanding of complex sourcing transactions in general. The frequency with which firms engage in IT sourcing transactions makes this domain a fertile ground for research. In fact, as noted above, the firm we studied had many more IT sourcing transactions underway during our research with them.

The findings from our application of the theory resulted in actionable means of improving the alignment of a transaction to a known governance form through bundling and unbundling tasks within the transaction. We feel this is perhaps our most important contribution to practice and theory for defining and improving the efficiency of acquisition transactions. This finding highlights the need for careful construction of transactions and study of the costs and benefits of choosing to manage multiple tasks within the same transaction.

FUTURE RESEARCH

Through this study, we have identified the following opportunities for future research:

We identified a more detailed layer of transaction governance. The IT asset acquisition domain provides many examples of each type of governance mechanism. Now that IST has provided a means of transaction analysis and the ability to match transactions and governance forms, future research may extend the development into each form of governance, with more detailed recommendations, process models, and tighter incentives.

In addition, the theory is not constrained to a firm-to-firm dyad. The techniques illustrated in this study could be applied to any dyadic relationship. An immediate example is to use the theory to understand individual employee/contractor motivation and performance on a task. Such an application will become increasingly important as simple employment contracts continue to be replaced by external transactions with individuals acting as contractors.

Finally, perhaps the most important finding of this research is the notion of bundling and unbundling transaction tasks in order to improve transaction efficiency. While this is a natural intuition that is not new with our work, the analysis of such changes is made more concrete with the Incentive-system theory. Further research into bundling tasks in different transactions to improve transaction efficiency could have dramatic impact on the practice of transaction governance.

REFERENCES


