A System Dynamics Model for IT Outsourcing Contracting Strategies

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ABSTRACT

The notion of outcome-based contracting originated from manufacturing and has evolved as one of the most desirable business models in service science. Although previous Information Systems (IS) studies have glimpsed the role of outcome-based contracting as a driver for system thinking and value co-creation, there are not many studies that examine fundamental issues arising from an outcome-based contract for IT outsourcing. This manuscript serves as an extended abstract to report on the initial stages of a comprehensive study which aims to examine strategies involving IT outsourcing contracting.

Keywords

Outcome-based contracting, IT outsourcing, value co-creation, IT value, system dynamics

INTRODUCTION

Some view outcome-based contracting as a contracting mechanism that allows the customer to pay based on outcomes, rather than merely on activities and tasks (Ng and Yip 2009). Others consider outcome-based contracting to be a way of reducing the detrimental effects of supply-risk events rather than a method of reducing the likelihood of a detrimental event (Zsidisin and Ellram 2003). In other cases, outcome-based contracting is viewed as a vehicle for delivering positive outcomes through collaborative processes and practices with the customer in a value creating system (Ng et al. 2012). It is, therefore, not surprising to see that there is not much consensus on what exactly outcome-based contracting can deliver especially in the context of an IT outsourcing contract. Considering the importance of IT outsourcing in today's business environment (Haag and Cummings 2012), a model that captures the complexities of the problem domain while permitting a systematic exploration of alternative strategies would be invaluable. Using the design science research methodology outlined in Gregor and Hevner (2013) and Peffers et al. (2008), which draw from ideas outlined in Hevner et al. (2004), this manuscript reports on the initial stages of the development of a dynamic model that allows managers to examine the effects of alternative outcome-based contracting strategies. Subsequent steps are planned and will include a comprehensive study, and the analysis of simulation data generated by the proposed model.

METHODOLOGY

The predictive capability of the model (artifact) represents one of the foremost objectives in this research. The ability to examine the impact of alternative contracting strategies under a variety of environmental and organizational conditions would provide managers with clear guidance when faced with the many decisions involved in IT outsourcing. Since the IT outsourcing relationship between clients and providers is dynamic in nature, the artifact proposed in this research is a model suite that will allow decision makers to evaluate the impact of alternative contracts (i.e. outcome-based contract and behavior-based contract) regarding IT outsourcing under varying environmental and organizational conditions. Simulation represents an attractive approach in that it can capture the dynamic relationship between constructs relevant to the problem, as well as permitting the study of these constructs over time. System dynamics (Forrester 1980) is a simulation technique using a combination of discrete time periods and a set of differential equations to relate key variables within and across time periods. System dynamics is well suited to the modeling of an IT outsourcing contract, in that it permits the problem to be studied over several time periods and allows appropriate action to be taken within a time period based on the prevailing environmental and organizational conditions. As with any modeling approach, concerns exist about the potential use of simplifying assumptions; possible inaccuracies in modeling vis-à-vis the real-world; and a lack of comprehensiveness in the final model. These can be alleviated through validation of the model across multiple strategies (Sterman 2000).

MODEL DEVELOPMENT

The model is designed to assess the ability of alternative IT outsourcing contracting strategies to realize the intended solution value. It considers contracting strategies (i.e. behavior-based contracts (BBC) and outcome-based contracts (OBC)); environmental conditions surrounding the sourcing contract (i.e. outcome uncertainty and information asymmetry); solution characteristics such as IT-Business alignment; and the implementation cost as represented by price. Alignment between business and IT has long been considered important for value realization (Choi et al. 2013). Accordingly, this research elects to model IT-business alignment as one of the major determinants to be delivered business value of an IT solution. The business value of the solution is used as a basis for solution price estimation when OBC is selected as a preferred form of sourcing contract, but does not play a role in the solution price estimation process in the case where BBC is preferred. BBC mainly concerns the time devoted to development relevant to the solution development effort. The size of the solution project, which represents project complexity, is considered the major determinant of the development effort. The model reflects technical and environmental factors and captures the complexity of the solution project. The system dynamics model for outcome-based IT outsourcing contracting is depicted in Figure 1.
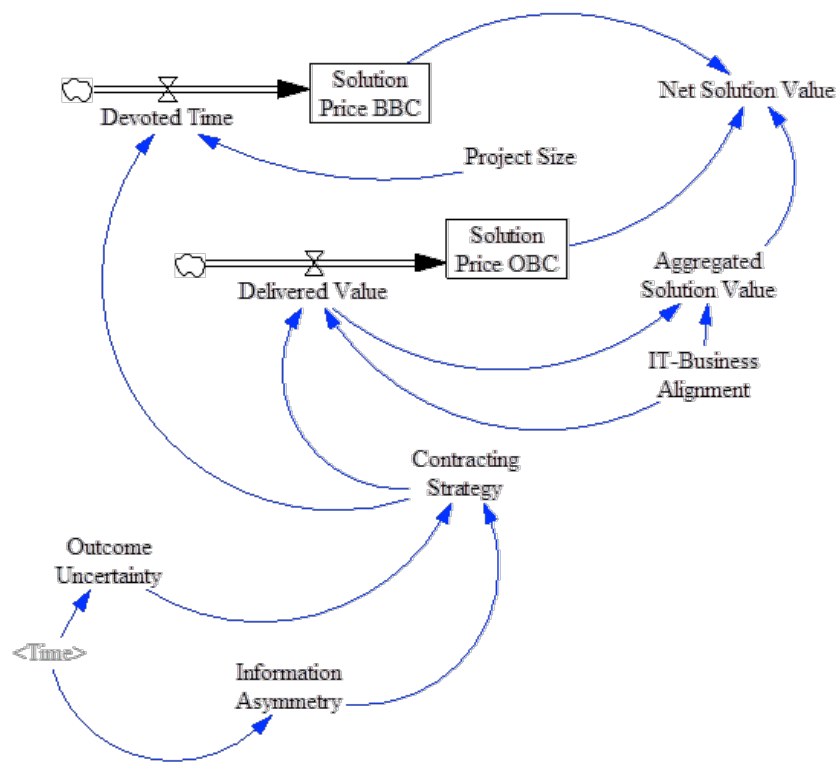

Figure 1. Outcome-based IT Outsourcing Contracting Model

The choice of contracting strategy is less a function of isolated one-party factors than it is the relationship between the solution provider and relevant project characteristics. Agency theory identifies contracting choices between the one based on how the agent behaves (BBC) and the one based on measured outcomes (OBC). An appropriate choice considers the trade-off between the cost of information acquisition for monitoring the solution vendor's behavior and the cost of determining how much the realized value comes from the solution (Rungtusanatham et al. 2007). Based on prior literature, we can identify outcome uncertainty and information asymmetry as factors that shape the decision on how best to formulate the type of contracting. Low levels of outcome uncertainty permit easier assessment of the relevant solution value, favoring outcome-based contracting as the preferred alternative. Conversely, monitoring vendor behavior is too costly and ineffective when the level of information asymmetry is high, making BBC an unviable option.

FUTURE PLANS AND CONCLUDING REMARKS

This article presents a set of initial steps with theoretical underpinnings for developing a dynamic model that allows managers to examine the effects of alternative outcome-based contracting strategies. The subsequent stages are planned as follows: A set of differential equations will be generated and tested with a series of pre-test scenarios. Once the model and associated equations generate reasonable and sound behaviors, a complete set of scenarios will be developed. The model will be applied to a case scenario examining the implications of alternative contracting strategies. A multipronged approach to the evaluation of the model will be adopted to validate the model and associated framework. Once completed, the modeling suite will provide managers with an opportunity to engage in a what-if analysis of many competing scenarios. The insights gained through the analysis of the simulation results should prove invaluable to managers when assessing strategies for outsourcing IT solutions.

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