

EFFECTIVENESS OF INFORMATION SYSTEMS OUTSOURCING: AN EXPLORATORY CASE STUDY

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ABSTRACT

The objective of this research is to construct an assessment model for measuring the effectiveness of Information Systems (IS) outsourcing. “Lack of expertise” and “cost effectiveness” constitute the major points of motivation for IS outsourcing. Although various decision models and analytical frameworks have been modeled before, the literature is not abundant on a complete qualitative model. In contrast with the decision models which are executed before an outsourcing engagement (a-priori), an effectiveness assessment model will be an a-posteriori guide which will enable the clients to measure their outsourcing performance and re-evaluate their business and management strategies. This paper examines the factors for outsourcing effectiveness through the framework of an exploratory case study for an IS developed by a major Turkish software house for a public organization.

KEYWORDS

Information systems, outsourcing, effectiveness, case study.

1. INTRODUCTION

In this study, the problem of Information System (IS) outsourcing effectiveness will be investigated. By “effectiveness” we mean the degree to which outsourcing reasons/motives of clients are achieved and the level to which in-house problems of concern are solved. This is an on-going research where initial cases presented in this paper will serve for the exploratory phase and future study will include explanatory case studies. The problem will be investigated with theories from economics, management, and sociology. Then, traditional and contemporary software development methods will be considered as factors that influence outsourcing effectiveness. Next, our research methodology will be explained and finally, the case study will be described and hypotheses derived from the case analyses will be explicitly stated. We will conclude with a summary, present a number of remarks and point out future research directions.

2. THEORETICAL FRAMEWORK

We have selected four theoretical models in light of Cheon’s 1995 study in order to understand clients’ outsourcing strategies and formulate our research questions. The main idea behind **Transaction Cost Economics** (TCE) is determining the make-or-buy selection. An asset is called *firm-specific* when its value for different uses is quite lower than its value for its current use. Existence of such assets allows opportunistic vendors to cause significant losses for the client (Nam, 1996). In TCE, this factor is called *asset specificity*. Often, it is cheaper to buy systems with low asset specificity even if clients are capable of developing them. On the other hand, processes like IS planning and control can be highly client-specific, i.e. with high asset specificity, therefore hard to obtain from the market. *Large clients with strong IS departments may not favor outsourcing*. Moreover, clients and vendors can go into an outsourcing deal *once or multiple times*. Renegotiation and consequent renewal of outsourcing contracts is quite common. From an economics perspective, **Agency Theory** focuses on the difficulties of the *information asymmetry* between the principal and the contracted agents (Dibbern, 2004). The *principal* represents the client and the *agents* represent the vendors. Asymmetric information between the parties causes *uncertainty* and different views of future risks.

Main focus of the theory is on the conflicting goals and requirements of the parties and the cost that the client shoulders for monitoring the vendor. Therefore, the main idea should be *determining the most efficient and effective contract which settles down the appropriate relationship in the deal*. **Resource Dependency Theory** (RDT) was originally formalized to discuss the relationships between organizations. From the competitiveness point of view, RDT proposes that *companies exchange resources to reduce uncertainty* (Oh, 2006). IS outsourcing is a very typical example of the application of RDT between clients and vendors. The level of the resource dependency is formulated in terms of the *resource value, number of candidate vendors supplying these resources, and the switching cost between vendors* in case of failure. The degree of this dependency can be seized through the contract clauses. *A higher number of contract clauses means the client is more dependent on the vendor*. If the firm acquires these resources, the dependency level decreases. **Resource Based Theory** (RBT) of a firm states that organizations have a lot of resources and some of these resources are more “valuable”, and hence brings competitive advantage to the organization. The sustainability of such resources for a long time makes the organization more powerful in the market. RBT reflects the strategy of how a firm diversifies its products through exploiting its resources by contracting with others, instead of expanding its size, viz. via outsourcing. *Outsourcing helps a lot in the sense that the firm thus focuses more on the core competencies while utilizing its resources to be used in contracted applications*. Alvarez-Suescun (2007) studied the resource based determinants in the outsourcing decision process.

3. SOFTWARE DEVELOPMENT METHODS

Information systems, whether built in-house or outsourced, are highly influenced by software development methods which have evolved quite fast in the last decades. The fast growth of software development methods have also effected the way businesses made strategic decisions like outsourcing their information systems and this section elaborates on these concepts where our research mainly concentrates on outsourcing deals driven by software development purposes. Firstly, **process improvement models** in software and systems development may increase the complexity of outsourcing deals. Among many process improvement models, *Capability Maturity Model Integration (CMMI)*, stands as a primer in terms of its detailed context and widespread use. This framework on managing, measuring, and monitoring software development processes is also used to benchmark software vendors against others to achieve lower cost and higher quality results. With the enormous growth of the outsourcing market, a client, more than ever, needs powerful tools to measure operational performance of the vendor. Process improvement models help organizations to raise the level of quality and estimate the time and resources to develop software systems (Hyde, 2004). Another, not necessarily alternative approach is **agile software development**. The main philosophy of agile approach is that *it initially accepts user requirements changeability and incorporates change into the product whenever necessary by incremental and iterative processes*. This way, a potential product release is always ready. *Communication* is an important barrier in any outsourcing deal. The communication problems cause the development teams to misunderstand the client requirements (Hazzan, 2008). If the system is outsourced to vendors with agile know-how, by nature, more effective communication channels are established which in return saves time in documentation (brief and frequent requirements documents), forming a stronger client-vendor relationship, and increasing measurement success through regular delivery of working parts of the system. *Trust*, on the other hand, is a common success factor both in outsourcing and in agile values. Enhancing mutual trust leads to more motivated vendor, and in return development staff. The economics of outsourcing deals has become quite popular in such a way that fast and cheap vendors come up with great competitive edge. Looking from this view, vendors concentrating on **software reuse** are making their internal development processes more advantageous. Software reuse can be defined as *developing software systems using existing software components*. These components may be any software product from requirements to source code, from proposals to design specifications (Mili, 1995). *Software reuse aims decreasing cost and time while increasing quality*. Logically, cost of an initial investment for the process is usually high but the expected pay-off during the whole development process overcomes this cost easily. Increase in the number of reuses decreases the cost of the end product. In parallel with this argument, *the richer this component library, the cheaper the software due to the logical fact that the amount of development time is minimized*.

4. RESEARCH METHODOLOGY

We designed an exploratory case study and planned qualitative data collection since such form of data provides rich and deep descriptions. On the other hand, in order to be more precise, we aimed to obtain multiple views (Runeson, 2009). Therefore, we used more than one data source, viz. both vendor and client perspectives for the same outsourcing deal. We would like to emphasize that the framework based on the theories and software development strategies discussed in the preceding sections are used to formulate our preliminary research questions for the case studies presented below.

The case is outsourcing of an Electronic Document Management and Archive System (EDMAS). It started on May 2010 and finished in 7 months. The scope included the purchasing and customization of vendor's document management Commercial Off The Shelf (COTS) product, analysis of sample business processes, definition and realization of these processes in the system, and training. Average number of users of the system was 1200. The first study has been performed with a *national software house* (**Vendor-A**) which has been in the software industry for almost twenty years. Having a CMMI-3 certification, Vendor-A is mainly specialized in e-government projects developing products with high-end software techniques like *software product lines, XML libraries, and reusable components*. The second study has been performed with one of the senior IT experts of a public organization (**Client-A**) who were the client of Vendor-A in the previous study. The interviewee was directly involved in the deal and also works as one of the system support engineers. Both parties were informed about the research details beforehand in order to maintain initial trust, avoid unethical issues, also enabling them to get prepared prior to the interviews. In addition, transcriptions of the interviews have been sent to the subjects one week after the interviews.

5. ANALYSIS AND RESULTS

Client's Need and Outsourcing Reasons: Documents in public sector are very critical and difficult to manage. There are regulations and standards issued by Turkish Prime Ministry and Turkish Standards Institution. Thus, all public organizations started projects regarding electronic documentation. Before EDMAS, almost all processes were manual and Client-A was able to follow and trace the documents in terms of quantity, source, and destination. EDMAS was acquired for handling official (signed and approved) documents with electronic signature and archiving which was one of the requirements of the government regulations. Main idea behind the project was automation. Client-A has an IT department mainly for system administration type of processes and *they do not have sufficient expertise and man power*. Moreover, *they do not have time* for software development since they can hardly manage other tasks.

Vendor Experience: The project was quite a success. Most important of all; Vendor-A had a very strong development team compared to the previous vendors the client worked with. Moreover, the *business analysts of the vendor were very experienced* both on partnering with public organizations and on document management know-how. Vendor-A has 16 years of *outsourcing experience* working with clients from both public and private sector, both national and foreign; not only developing systems from scratch but also selling customizations of COTS products of their own. Vendor-A was the correct organization to work with since both the company and the individuals were experienced in outsourcing (one of the analysts was a transfer from a document management company). In terms of requirements specification process, the vendor continually evaluated users' knowledge. Since the acquired system was one of the vendor's *COTS products* – customized for Client-A, it saved quite a considerable amount of time. Otherwise it would have cost approximately two full years. Such experienced vendors having infrastructure and frameworks ready to be customized have an advantage to win the tenders for suitable projects. The outsourcing experience of the vendor can be measured in terms of number of years the *organization* is involved in outsourcing deals in addition to the *individual* outsourcing experiences of the members of the development team.

- *Hypothesis1: The outsourcing experience of the vendor positively effects vendor success.*

Partnership: Unfortunately some vendors with the 'I can develop anything requested' attitude can be quite informal and this is reflected to the *partnership* throughout the contract period. Vendor-A enables a long-term strong partnership with the clients by sharing their working model transparently. They maintain *trust* by applying negotiations clearly, trying their best upon explaining the benefits of their working models for the client. They provide 10 to 15 of their own staff to the client for the service period. Special focus should be

placed on *trust* where high level of trust is needed in an outsourcing relationship since it can be viewed as a strategic partnership. Thus partnership quality is proportional to the level of trust between the client and the vendor. This can be determined through shared experiences and should start at the very beginning of the relationship. Although it usually is called as an informal (or *psychological*) contract, trust can be maintained with the real contractual items as well (Sabherwal, 1999). Vural (2004) mentions this view of trust as an important success factor in another case study (from public IS outsourcing).

- *Hypothesis2: The level of partnership quality is positively associated with outsourcing success.*
- *Hypothesis3: The level of trust between the client and the vendor is positively associated with partnership quality.*

Risk Management: Good vendors would like to finish the project as soon as possible since they allocate resources for this project and they want to free them back. Most of the clients do not perform a solid *risk analysis* in terms of various aspects of the project (e.g. profit-loss analysis). Client-A has not performed any sorts of a risk analysis but they have spent sufficient time for the RFP. Besides, Vendor-A has won the tender for a lot of reasons including that they made a solid cost and size estimation for the given RFP. Most of the vendors do not do that. Vendor-A has a lot of ‘enterprise clients’ where such clients do perform such analysis more professionally. An example can be the requested ‘collateral’ from the vendors during the contract period. The amount of collateral for such enterprise clients can be quite high but this way they do guarantee a lot of issues during this period. Risk management techniques have to be considered and there are two main processes to be taken. First, the clients should proactively identify the risks and then determine the control procedures for these risks.

- *Hypothesis4: Adoption of risk management techniques positively effects outsourcing success.*

Vendor-specific Results: Vendor-A’s perception of *third party support* is the academic support provided by university academicians. They reside in a techno park where most of their junior developers continue their graduate studies at the university. They believe such support is crucial for transparency and objectivity and especially public sector clients should heavily consult to universities through these techno parks. *Methodologies and maturity models* are vital for vendor success; not only for software development but also for other processes. Having a CMMI-3 certification, *Vendor-A applies methodologies for tender preparation, purchasing and accounting in addition to software development.* They claim that it is impossible to make time even to prepare a proposal without CMMI compliance. *Internal training* is also crucial for vendor success. Vendor-A holds formal trainings including CMMI, SPICE, ISO trainings, and various software engineering and project management trainings. They also support junior developers for graduate studies, required that they work on related fields and projects at the university (e.g. software management, XML parsing, CORBA, db transaction management).

- *Hypothesis5: Having methodologies and maturity models for software development processes positively effects vendor success.*
- *Hypothesis6: Academic support and internal training for software developers positively effects vendor success.*

Client-specific Results: One of the critical success factors is the *level of computer-literacy* of the client’s end-users. Users get used to GUIs where any slight change in these may create problems enabling them to frequently ask help from Systems Support unit. Therefore, *end-user training* for client users is crucial and Vendor-A provided a very efficient training period for EDMAS. No third party support is used for this project. On the other hand, Government Archives Agency of Turkey – as a regulatory body and like a consultant – examined the project and the end product, by means of an *auditor*.

- *Hypothesis7: Internal auditing of the client and user training positively effects outsourcing success.*

From the data analyses, results show that the major factor for IS outsourcing effectiveness is a successful vendor. Therefore:

- *Hypothesis0: Vendor success positively effects outsourcing success.*

The initial exploratory model can be viewed in Figure 1.

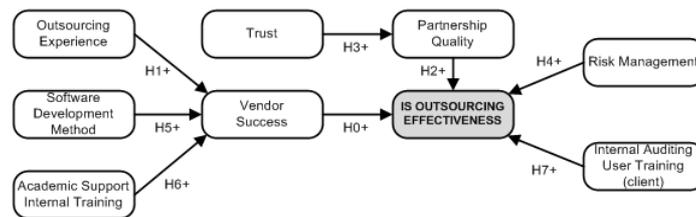


Figure 1. Information systems outsourcing effectiveness model

6. CONCLUSION AND FUTURE WORK

The objective of our case study was to explore IS outsourcing experiences, the factors effecting the success of such outsourcing deals, and how these factors are related to the outcome. We have planned the cases and prepared our design with our background from four theories and major software development methods. We have come up with eight hypotheses which will be used for our future research which will include explanatory and confirmatory cases seeking ways of answering the following questions from the clients' perspectives: "Have we achieved the expected cost/quality?" and "Has this deal contributed to my IT maturity and business processes?" Although we are developing an a-posteriori model, it will also work as a decision model in light of best practices for future outsourcing deals for clients and vendors. Future cases will be selected mainly from clients and these will focus on *tender processes* and *contractual issues*. Moreover, clients having certified software acquisition maturity models will be preferred.

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