Extending IT Outsourcing to Internet-based Outsourcing

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1. INTRODUCTION

Internet (more accurately, the World Wide Web) has enabled the development of "online outsourcing." Online outsourcing involves the outsourcing of applications by firms to third parties (called Application Service Providers or ASP) over the Internet [5]. The ASP model of outsourcing (Figure 1) consists of three types of firms – firms outsourcing applications (hereafter client firms or, simply firms), the ASP firms, and hardware and software vendors. In addition to the application of the Internet to IT outsourcing, the ASP model of outsourcing also differs from traditional outsourcing in the level of outsourcing. Namely, the level of outsourcing is the application level in the ASP model, whereas in traditional IT outsourcing, specific data processing, IT infrastructure or software development projects are outsourced. The applications provided by the ASP seamlessly integrate into the business processes and information processing activities of the client firm on a real-time basis. The exact scope of ASP operations and differences from traditional IT outsourcing are explained in the next section.

In this paper, our express purpose is to provide MIS researchers with relevant research directions and questions in online outsourcing by drawing on existing knowledge in the MIS area. We conducted an exploratory field study and developed research questions based on these preliminary observations. Here, we describe various frameworks in which to view the research so as to better understand this new development in Internet commerce, and to help us differentiate between media hype and truly innovative business models.

A study of the ASP business model is suitable and interesting to researchers for several reasons. First, the use of the Internet in IT outsourcing is a logical extension to traditional outsourcing practices, given that Internet use has become ubiquitous. The real-time, online use of applications across organizational boundaries has different implications for managerial control of business processes. Second, several traditional IT outsourcing projects have failed and ended in litigation [11], because of the lack of guidance to managers from researchers on these issues. As researchers, we can address such issues and discuss them prior to unsuccessful implementation of the business model. Third, ASPs could be classified as value-adding electronic intermediaries (see section 2). The study of electronic intermediaries has important implications for Internet commerce, and to understand the changing boundaries of the firms (scale and scope) due to the Internet.

2. DEFINITION OF ASP AND INTERNET OUTSOURCING

An ASP is "a company that is remotely hosting a software application and providing access and use of it to clients over a network on a recurring fee basis around the globe" [9]. By bringing together various vendors such as software and hardware vendors, Internet Service Providers, and data processing centers, an ASP creates and maintains standard applications in centralized sites. Via Internet or private network, an ASP is able to use a "one-to-many" operation paradigm allowing several client firms to access and use the same application stored in centralized sites [15]. Each client firm contracts with an ASP on a flat monthly payment basis rather than making large capital or labor investments as in traditional settings so that client firms are freed from the onus of developing, maintaining, and operating complex business applications.

In general, an ASP builds standardized application systems supporting a certain section of business processes. Client firms pay a flat monthly fee for using ASP's application service under an outsourcing-type contract. Trade literature defines an ASP as a value-adding reseller of software applications "who manages and delivers application capabilities to multiple entities from a data center across a wide area network" [22]. The application hosting model consists of several entities: a data center, a wide-area network (private or the Internet), independent software vendors, and application experts, among others [6]. The ASP business model consists of two intermediation steps. First, the ASP maintains a strategic alliance/partnership via licensing agreements with suppliers of hardware and software. After appropriate configuration of the infrastructure and subsequent development of standardized applications, the ASP rents the applications to many clients (Figure 1).

Examples of applications outsourced using online outsourcing are Web presence, order taking, translation of EDI documents to vendor-specific formats, etc. Several ASP type firms have emerged in the past couple of years such as Citrix [6], Interaliant [36], etc. These companies are true intermediaries (that perform a value-adding service) in the sense that they buy or license software and hardware from vendors, develop applications, and customize them for client firms. In addition, existing software companies such as Microsoft, SAP, PeopleSoft are also adopting the online outsourcing model, playing both parts – the vendor and the ASP.

2.1. Is the ASP Model an Inter-Organizational System (IOS)?

Based on the description above, the operations between a client firm and an ASP resembles both an IOS and an outsourcing situation. Hence, though the IOS literature [16] may provide a good conceptual grounding for understanding ASP, there are some conceptual differences. First, IOS is typically implemented by a firm that may control upstream or downstream markets [14]. ASP is typically an independent third-party vendor and does not belong to any firm in the vertical or horizontal directions of the supply chain. Second, the ASP invests labor (expertise), and some-

times capital, in new technologies, thus assuming the risks and uncertainties of new technologies. ASP companies pick a combination of vendor products to provide applications and software development environments to the clients. Hence, client firms do not incur fixed costs, as in IOS context in which they may be required to invest in specific capital or labor. The ASP services provided to client firms are paid on a periodic basis. Client firms do not own the technology or the application. Third, ASP exploits the Internet, whereas traditional IOS was implemented using value-added networks (leased lines) or virtual private networks (proprietary networks). Fourth, the ASP type model focuses on applications, which are considerably smaller than the scope of IOS.

2.2. ASP versus IT Outsourcing

IT outsourcing has been studied in MIS literature along two lines of research – outsourcing of data processing and outsourcing of IS development [2, 3, 23, 35]. Online outsourcing is a hybrid of the two solutions. Hence, the ASP model of outsourcing should more appropriately be called outsourcing of the management of information. This is because, as explained above, ASP companies add value by configuring rented/licensed infrastructure to serve the needs of the applications market. The development of the application software is carried out by the ASP resembling outsourcing of IS development. However, once customized, the application continues to physically reside at the ASP site and data from/to customers or suppliers of the client firms are routed through this application, thus resembling outsourcing of data processing. The ASP conducts the operational maintenance, including technical help to customers/suppliers of the client firms and customization.

Developing software internally involves two types of risks: 1) selecting the right hardware and software platforms, and, 2) producing an application on these platforms that is successful. The ASP assumes most of the risk of selecting the right hardware and software. Client firms need only concentrate on ensuring that the application is suitable to them, regardless of the platform. The decision to use development environments on hire will also be based on the continuing shortfall of skilled labor in IS departments, as we have seen in traditional IT outsourcing [28].

3. RESEARCH AND PRACTIONER ISSUES IN ASP OUTSOURCING

Research has viewed outsourcing along diverse discussions such as the theory of firms (e.g., resource-based theories [30], transaction costs [24]), make-versus-buy decisions (and lease-versus-buy) decisions in capital investments [12], and economies of scale and scope in production. Dimensions for studying ASP type outsourcing, while borrowing from existing outsourcing literature, should consider the following: 1) granularity and position of outsourced application with respect to overall business processes, 2) ownership of the software and hardware is with the ASP, 3) location of the hardware and software, 3) location of client company's data and information with respect to the process, and 4) method of payment such as rent/revenue basis of agreements. Data and information ownership is with the client itself, but is "flowing" through and, most often, residing in the ASP's premises. Some questions that managers and researchers may ask pertaining to success of the ASP business model are as follows.

1. What types of applications (type of application may be defined as, 1) position relative to overall business processes; 2) strategic impact, etc.) might be outsourced? And why?
2. What types of contracts will work and what aspects (such as ownership and rights) should be covered in these contracts? How should the rental prices of applications be determined (outcome-based, use-based, etc.)? How often should contracts be renewed?
3. How should managers evaluate various ASP services available, and how to re-engineer processes or to determine customization of the application? How to successfully implement application outsourcing with lower costs and ease of switching to other ASPs or in-house development in case of failure?
4. How do ASPs affect and add value to existing software product markets by creating a resale market for application development?

To answer some of these questions, we as researchers should first ask what frameworks from existing research might we use to study application outsourcing. The above questions essentially ask us to determine, quantitatively and qualitatively, the costs and benefits of the ASP type outsourcing model to the various parties involved in ASP use, as well as, the effects on the IS function and on the software industry, in general.

The existence of a market for ASPs is evidence that client companies benefit from ASP outsourcing. Costly acquisition and internalization of technology are avoided. While the benefits of ASP outsourcing are numerous, there are also several risks. Typical risks associated with high technology outsourcing prevail – the risk of not developing the right skills, loss of control over process and technology, possibility of not being a leader in strategic use of information, etc., [8]. Two additional risks arise due to the online nature of the ASP operations. First, live data is routed to and from the company and its external constituencies (such as customers). ASP, though may agree to non-disclosure clauses, have access to the data in client companies such as customer contact information, sales trends for products, etc., which could be used strategically by the ASP for its own benefit. Requests for additional information processing may reveal the strategic actions of the client firm to the ASP. Second, if the client firm re-engineers its process and the ASP adapts its application to the re-engineered process, the benefits of the re-engineering learned by the ASP would spillover to other clients of the ASP, which may include competitors of the innovators.

4. RESEARCH FRAMEWORKS TO VIEW ASP ISSUES

4.1. Strategic Outsourcing

The choice of applications to outsource to an ASP may be informed by existing research in strategic outsourcing. Strategic outsourcing refers to making outsourcing decisions based both on efficiency and effectiveness of business processes [7, 18, 26]. Efficiency may be viewed from both technical and cost efficiency. Effectiveness refers to concentrating resources (capital and labor) on core competencies. This approach is prone to difficulties [17] beginning with the very definition of core competence [26]. The determination of core competencies in the ASP context should probably not be done at the firm level, but rather at the department level or even process level. That is, rather than concluding that, for instance, distribution is not a core competence of a firm, the firm should look at the processes or applications within the distribution operation to determine which applications to outsource. Hence, the unit of analysis (application) is different from the unit of analysis (process) applied for traditional IT outsourcing.

Current business wisdom encourages companies to leverage availability of information from all their various process to determine strategic advantages. Hence, owner of process, or at least information from the process, will play a critical part in the suc-

cess of ASP. Outsourcing the entire IS function has been fraught with failures [19]. Instead, selective outsourcing has been suggested. In application outsourcing, this selection must be done at the activity level, rather than the process level. Further, the selection of application for outsourcing must depend not only on current core competencies, but also on developing new core competencies [33]. Tactical reasons (other than strategic reasons [7]) for outsourcing include lowering barriers to entry imposed by the large capital and skilled labor investment required in several industries. The large number of small- and medium-sized enterprises that are currently clients of ASP firms is evidence of this. Decisions made on such tactical reasons should also be conducted based on current/future core competencies and selective outsourcing.

4.2. Residual Rights of Control and Property Rights

The success of the ASP model will depend on the contractual agreements governing the allocation of residual rights of control [13]. For example, system maintenance and upgrading could be specified as the client company's right and the ASP's responsibility. That is, if the application needs to be changed (because of business process change or inadequate user requirements), then the client company could demand upgrade at any time. Such contracts would indeed be costly for the ASP. If the IS function were handled internally, arrangements such as user's commitment to requirements exist to avoid requirements creep. However, in a competitive provision of an application through an ASP (and assuming switching from one ASP to another are not very costly), the costs of requirements creep may be shifted to the ASP rather than users of the technology.

"Creativity degradation" is considered yet another risk with outsourcing [31]. Business process reengineering requires both a deep understanding of current processes and information, and a creative redesign of the processes. However, if the application and information reside elsewhere, the client firm may not be able to reengineer it. Further, if the client re-engineers the application, and the knowledge regarding the application/process and strategy becomes known to the ASP, the client firm faces the threat that the ASP knowingly or unknowingly may inform a competitor of the client about the application functionality. Thus, the negative externality that results from the knowledge spillover is also a risk in application outsourcing. Hence, to avoid creativity degradation and negative externalities from spillovers, the governance mechanisms (administrative control and property rights) of the application must be designed carefully. As in the case of R&D contracting [1,31], solutions such as combining the clients' rights to control changes in the ASP's application with the ASP's property rights to the final application would be appropriate in this context.

Property rights discussion may also inform the granularity and type of applications that could be successfully outsourced. For example, applications that integrate across functional boundaries in a company may be ideal candidates for outsourcing [25], especially in ASP type outsourcing. This is because the ownership and use of the process and data is no longer a department/functional area matter, but a matter to be dealt with the ASP at the organizational level. Finally, a client may "disaggregate" [4] applications across various ASPs, which makes the property rights issues more complicated.

4.3. Information Flow and Managerial Control

In the discussion on types of applications that may be outsourced, it may also be surmised that other determinants of application outsourcing would be managerial control on the application and the information regarding the process and its output [29]. With regards to managerial control, the position of the application with relation to the production stage becomes important. Since managers may prefer to have complete information and control over final stages of production (which may affect his/her payoff), they may not outsourcing intermediate or final stages of production. Alternatively, the outsourcing contract may be designed to provide managers more control over such applications. In addition to control, managerial incentives may take other forms and all managerial actions are not necessarily in the best interests of a company as has been discussed in principal agent literature [20].

4.4. Transaction Costs and Incomplete Contracts

The concepts discussed under this section are closely tied to the concepts discussed above in the section on residual rights of control. As explained earlier, the ASP model is congruent to a model of intermediation between software vendors and clients. Transaction costs [21, 24] will provide a useful framework to determine the factors that would affect the relationships of the ASPs with client and with software vendors. The continuing relationship between an ASP and its client will depend on the fulfillment of contractual agreements between the two parties involved in the outsourcing transaction. Detailed contracts with flexible contracting options such as flexible price schedule, performance-based contracts, etc., would be more successful as proposed in the traditional IT outsourcing [17]. While contracts will be inherently incomplete, IS researchers must find contingencies that could arise in ASP model and provide prescriptive directions for designing contract [32,34]. For example, the characteristics of applications governing the choice of fee-for-service type of contracts over strategic alliance type contracts could be different from those of IT outsourcing wherein fee-for-service was not preferred for immature technologies [17]. To ensure that clients are paying market prices and not locked-in prices, they may require short-term contracts or flexibility in the price schedule based on market rates.

Hence, the success of the ASP business model may finally depend on the ease of switching from one ASP to another ("extent of substitution by vendors" [24]) and the structure of contracts that accounts for this possibility. In the case of IT outsourcing, switching was difficult due to asset (technical and labor) specificity. The ASP model would be more effective if the specificity associated with traditional outsourcing is eliminated and the application outsourcing market is competitive.

5. CURRENT STATE OF ASP INDUSTRY

The ASP industry has grown dramatically in the last two years. ASP Industry Consortium, starting from about 25 members in May 1999, has about 315 members in 2000 [5]. The projected annual ASP spending for 2003 is predicted to range from $2 billion to $22.7 billion [9]. Despite the perceived benefits of ASPs, it is not clear if the ASP model will be accepted. Industry market research firm cannot conduct a survey to determine the state of the ASP industry because not enough ASP users can be found. Among several conducted surveys, more than half of interviewed IT managers said they had no plan to work with ASPs, the availability of application supplied by ASPs and the control of applications handed to ASPs are still great concerns for clients firms [36]. From a recent IDC's research on the state of the ASP industry, more than half of the 400 top managers were familiar with ASP, but only 6% possessed detailed knowledge about ASP and just over one-third of those people said they would consider using ASP. A study on electronic commerce adopted by small business showed experienced benefits of E-C was still intangible the application of E-C in small business was immature.

6.CONCLUSIONS

In this paper, we discussed the development of application outsourcing over the Internet by providing definitions and terminology. We then discussed research theories that may be useful in understanding the evolution of these practices. We did not consider behavioral models of managerial decision-making, that may include trust and other latent variables that determine ongoing long-term relationships [10, 27]. Such models will also add value to research in this area.

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