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# Managed Security Service Providers: Issues in Outsourcing Security

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## ABSTRACT

The issue of trust and risk in outsourced relationships was extended beyond traditional outsourcing models with the introduction of Application Service Providers (ASPs). As ASPs evolve, Managed Security Service Providers (MSSPs) have emerged as external providers of security for firms facing increasing information assurance threats. This research-in-progress paper develops a conceptual model of MSSP adoption; it investigates variables that affect the adoption and management of the relationship (trust, risk, reputation and relationships with vendors).

## Keywords

Outsourcing, Security, Information Assurance

## INTRODUCTION

Outsourcing has matured since its inception in the early 90's (Aubert et al. 2004; Choudhury et al. 2003; Walsh 2003). Firms initially looked to outsourcing as a method to lower costs, gain access to skills not found internally, or to refocus on core activities; outsourcing is now becoming a growth-oriented strategic tool (Goo et al. 2000). Development of the industry has allowed firms to select options for outsourcing that range from arms-length contracts to strategic partnerships or alliances. The new areas for growth are in off-shore outsourcing and Application Server Provider (ASP) based outsourcing arrangements (Oh 2005). ASPs manage and distribute software-based services and solutions to customers across a wide area network (either using the Internet or a private network) from a central data center.

The pervasive growth of the Internet combined with an ever increasing reliance of firms on inter-organizational networks has increased the vulnerability of computer systems and led to a renewed focus on information security. Electronic dependencies and interconnections create vulnerabilities that are being rapidly exploited by criminals (Colwill et al. 2001). Information Assurance (IA) has developed as a field that focuses on system security and data protection. Traditional approaches to security are not applicable: distributed and shared teamwork by multiple firms is not supported, the degree of collaboration or coupling between firms is higher, attacks are increasing in frequency and complexity, and the use of networked technologies increases vulnerability. Focus and priority are essential in applying cost-effective security countermeasures and other protections and reaction capabilities (Colwill et al. 2001).

The increasing burden of monitoring and maintaining current security protections has forced firms to seek other alternatives. Managed Security Service Providers (MSSPs) have emerged as a variant of ASPs that focus on providing and maintaining the security infrastructure for firms. This paper contributes to the existing literature on outsourcing in three ways. First, it looks at the role of MSSPs within the current security context (What is different about MSSP adoption?). Second, it adds the information assurance component to previous outsourcing literature by investigating the issues that impact MSSP adoption within the current insecure environment. Finally, the model identifies conceptual variables such as trust, risk, reputation, and relationships with vendors that affect adoption; it introduces the notion of security specific firm risk and the possible consequences.

## THEORETICAL BACKGROUND

Agency theory and the related incomplete contracts theory (ICT) focus on trust and risk while Social Exchange Theory (SET) explores the relationships with vendors and their reputation/capability. The economic arguments that promote the adoption

of ASPs cite cost savings as a key reason (Lacity et al. 1998; Smith et al. 2003). Agency theory (Eisenhardt 1989) extends the transaction costs notion by focusing on the actions of the parties in the relationship and the risks and motivations of each party. Trust and risk are significant to security; as the research on outsourcing matures, the focus is shifting from “why to outsource” to “how to manage the relationship.” Previous research has identified trust as a key factor in the outsourcing process (Sabherwal 1999) and has shown that contracts are needed to protect parties due to the emergence of new technologies or changes in the relationship (Beulen et al. 2003). A key assumption of ICT is that contracts are always “incomplete”. These contracts have not covered all contingencies and scenarios (Hart et al. 1999). Outsourcing relationships are not static; they are likely to change and evolve over time due to changes in the external environment and in clients’ internal requirements (Kishore et al. 2003). The trust between vendor and client is also subjected to these changing relationships.

Under Social Exchange Theory (SET), agreements between the client and the vendor involve exchanges that provide benefits and rewards. Interactions are affected by reputation and the relationship experience. These exchanges create obligations between the parties (Blau 1964). The exchange relationships between MSSPs and their clients evolve through interactions. Focusing on the exchange relationship extends previous studies that look only at the customer perspective (Koh et al. 2004). The relationship may take many forms; the mutual exchange motivates the parties to consider the relationship important in and of itself, and to devote resources towards its development and maintenance (Dibbern et al. 2004).

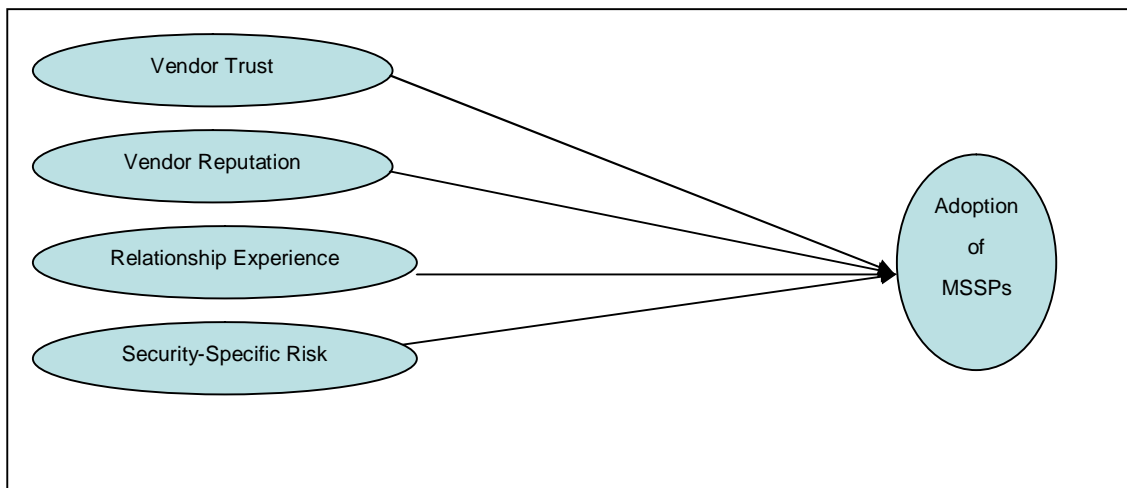


Figure 1 – Research Model

### SECURITY INFLUENCES ON MSSP ADOPTION

**Vendor Trust:** The role of trust is increased in a vendor relationship where the security of the entire organization is at stake. The services provided by MSSPs will require higher trust levels between vendor and client especially when it includes information assurance concerns. Vendor trust has previously been identified as an inhibiting factor to adoption and as an antecedent in exchange relationships that involves risks and vulnerabilities (Hart et al. 1998; Sabherwal 1999). Trust prevents opportunistic behavior exploitation (Zaheer et al. 1998); trust is an important aspect of interorganizational relationships (Hart et al. 1998). The most important factor affecting success of outsourcing appears to be a mutual understanding between clients and their service providers (Kishore et al. 2003). The management of the relationship builds trust that allows for other data security issues to be resolved. The organization will be more likely to engage in external contracts in the presence of high trust.

**Proposition 1: High Vendor Trust will be positively related to MSSP adoption.**

**Vendor Reputation:** Firms that are considering outsourcing their security will place high emphasis on the reputation and capability of the vendor. They need to be reassured that in turbulent times, the vendors that they contract with can guarantee that they will not disappear or renege on service level agreements. The lack of reputable vendors was previously found to dissuade adoption of new technologies (Ang et al. 1998). The availability of reputable and trustworthy external IT security service providers in the market can also be a concern to firms seeking to adopt new technologies (Susarla et al. 2003). The supply-side of IT outsourcing remains under-researched in the academic literature (Seltsikas et al. 2002); current research needs to investigate the relationship between parties (Koh et al. 2004) and the management of that relationship. Vendor reputation is an antecedent to trust (Heart et al. 2004). Vendors entering the MSSP industry must demonstrate their

capabilities to combat the latest threats. Not only is the contracting firm's security at risk, but the reputation of the vendor can easily be harmed by an inadequate protection and response plan.

***Proposition 2: High Vendor Reputation will be positively related to MSSP adoption.***

***Relationship Experience:*** Outsourcing should be considered more as a management of relationships between service providers rather than a simple subcontract for IS commodities (Kishore et al. 2003). The relationship between the client and vendor evolves and has been the subject of numerous outsourcing papers (Ilie et al. 2004). Successful relationships increase trust and willingness to contract out services; unsuccessful relationships can poison the partnership and lead to termination. Previous research has shown that these relationships change and evolve over time due to changes in the external environment and in clients' internal requirements (Kishore et al. 2003). Long-term relationship was found to be more successful than short-term arms length relationships (Lee et al. 2004). The key to achieving benefits from outsourcing is maintaining positive client-supplier relationships (Alborz et al. 2004). Prior relationships with vendors can also affect adoption behavior. Trust can be increased if successful prior relationships exist; perceived risks can be lowered and existing relationships can be strengthened. MSSPs are an extension of ASPs; a user's satisfaction with the ASP is the result of the evaluation of the ASP's services as a comparison with prior experiences (Susarla et al. 2003). Prior relationships that include positive outcomes and equitable treatment increase the chances of developing longer relationships (Ho et al. 2003). Relationship experience combines previous and current experiences with vendors to create a level of willingness within firms to use outsourced services.

***Proposition 3: Successful Relationship Experience will be positively related to MSSP adoption.***

***Security- Specific Risk:*** Risk can be defined as the probability of a negative outcome and the importance of the loss of this outcome (Aubert et al. 2001). Most of the risk in outsourcing has been researched under transaction cost theory (Bahli et al. 2005). Outsourcing allows clients to shift the risks of technological and skill currency to the vendors. Quantifiable short-term and long-term payoffs may support strategic initiatives by top management to use MSSPs to deliver the most current protection in uncertain environments. MSSP contractual agreements are still evolving to an industry standard. Under ICT, the relationship between the parties is governed by the current contract and must be renegotiated periodically. Outsourcing sensitive information has inherent liability if the vendor fails to secure information. The risk increases in magnitude when the outsourced function is "security". While risk in general is a concern, the willingness of a firm to trust its security to a third party vendor amplifies the risk level. Breach of security may have detrimental impacts on a firm's ability to operate and to its core functions; performance risks associated with the vendor's ability have always been a concern with outsourcing. MSSPs risks tend to focus beyond the incomplete contracts theory.

***Proposition 4: High Security- Specific Risk will be negatively related to MSSP adoption.***

## DISCUSSION AND FUTURE RESEARCH

This paper contributes to the outsourcing literature by looking at the evolution of ASPs to address current information assurance threats. As an ASP derivative, MSSPs have emerged as external providers of security for firms facing increasing information assurance threats. Security and reliability were previously identified as important performance characteristics for ASPs to deliver on (Walsh 2003). Adopters exist at various stages in the process of adoption of MSSPs. For our research, we will apply a seven-stage adoption model (Fichman et al. 1997) that allows for richer data analysis than a simple dichotomous adoption variable; this provides the researcher with vendor penetration and industry stages.

The effect of MSSPs on the way we perceive security and organizational boundaries is changing. The potential risks to both the vendor and the client emerging from MSSP adoption can be quite different. Organizations fearing the loss of control and flexibility in outsourced relationships may ignore MSSPs to deliver security. The nascent MSSP model requires additional research. The authors intend to extend this research-in-progress through a survey of MSSP vendors and clients as part of a larger research project using additional variables. The role of IT security and information assurance within firms may influence the direction of MSSP adoption.

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