



# Market reaction to application service provider (ASP) adoption: An empirical investigation

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## ABSTRACT

We examined the impact of ASP adoption on the market value of the firms and explored contextual factors in the positive abnormal returns. We employed event study methodology to analyze 268 ASP adoption announcements from 1998 to 2007. The results indicated that ASP adoption announcements were associated with positive increases in the market value of the firm. In addition, differences in market returns to ASP adoption were found to depend on strategic adoption intent, firm size, industry, and vendor status. These results provide useful implications for making decisions about whether, when, and how to adopt ASP to maximize the business value.

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## 1. Introduction

With the rapid advance of Internet technologies and the expansion of network infrastructure, the application service provider (ASP) has gained attention as a viable option in delivering software services. An ASP delivers and manages applications and computer-based services from a remote center to multiple customers via the Internet or a VPN [27]. In seeking improvements in IRM, many firms have begun considering its adoption. According to the Gartner Group, Software-As-A-Service (SaaS), which shares common themes with ASP and On-Demand Service, will deliver about 25 percent of all new business software by 2011. International Data Corp. also predicted that healthcare, professional services, banking, financial services, and even local government would soon be using ASP services. From a managerial point of view, the procurement of external software and services via ASP is promising. Benefits include a focus on core competencies, an ability to access a broader range of applications, scalability while maintaining flexibility during business environment changes, and less concern about a lack of in-house expertise (reduced need to attract and retain qualified workers).

However, the adoption rate of ASP services has been increasing at a modest pace. Furthermore, many service providers have failed to acquire a large client base and satisfy customer needs. Such a

situation questions the viability of the ASP business model. To address the discrepancy between expected and realized benefits of ASP, some IS researchers have examined issues such as potential benefits and risks, relationships, and key success factors on ASP choice. However, there has been little research that empirically assessed the business impact of ASP adoption.

The purpose of our study was to examine the impact of ASP adoption on the market value of the firms. In particular, by employing an event study methodology, we empirically investigated how investors perceived and evaluated the announcements of ASP adoption. From the efficient market theory, we expected that if the market believes ASP adoption announcements have a positive effect, then the value should be reflected in the market price of the firm's common stock. In addition to examining the impact of these announcements, we also explored contextual factors, such as firm size, industry sector, and vendor status. ASP is an emerging area where it is hard to capture the full spectrum of impacts, since most tangible and intangible benefits have not yet been proven. Thus, our study can provide an opportunity to understand the practical implications of ASP implementation, which can be helpful in making future ASP-related investment decisions.

## 2. Literature review

We review ASP adoption in two research streams: the literature regarding the ASP phenomenon, then various types of IT investment announcements and their impact on the market value of the firm.

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### 2.1. ASP: emergence and evolution

Since the concept of ASP was introduced, it has experienced different levels of adoption success by organizations. In the beginning, the idea of consuming software applications like a utility (e.g., electricity) through the network was discussed by the media and industry analysts. ASP provisioning, mainly driven by start-up companies, was seen as a radical innovation that would change the entire course of software delivery.

However, most early ASPs provided diverse applications on various platforms. Thus, selecting the ASP that offered the best application for specific functions often required outsourcing each application to a different ASP, resulting in compatibility issues. In addition, the uncertainty surrounding the effect on existing business processes and several other problems, such as lack of customization, legitimacy concerns, and the dot.com crash caused failures of many ASPs. There were a few like Salesforce.com that had built a successful business, but generally the ASP industry was deemed a fad.

With enhanced value-added services and new business practices, many ASP firms have now found ways to address the challenges, and provided a second wave of ASP. First, the idea of an ASP aggregator was introduced; the aggregator (e.g., Jamcracker) was a third-party company that combined and offered a number of services or suites of products, usually from a set of partners. Since the aggregator offered a single point of access, management, and service support to its customers, this model was especially useful when there were a significant number of ASPs from which to choose [13]. Another noticeable trend was a shift from pure play start-up companies to alliances or partnerships in the mainstream of IT services. ASPs increasingly merged or were bought by established IT companies, such as Microsoft and IBM, in order to gain legitimacy while avoiding financial burden.

### 2.2. ASP research trends

Early research on ASP focused on describing the prospects of the model, and was exploratory in nature; the main issues typically included origins (selective outsourcing, application hosting, browser-based computing), benefits, risks, challenges and the future of ASP. As an outsourcing option, ASP adoption had potential to fill; the gaps between available and required IT resources and capabilities. One important debate surrounding ASP was the extent to which ASP was different from traditional IT outsourcing. If one considers ASP simply as a derivative of traditional IT outsourcing, the impact of adoption announcements can be understood in the context of IT outsourcing. However, ASP possesses unique characteristics that set it apart from traditional outsourcing. For instance, the ASP business model provides a one-to-many relationship model, where standardized or customized applications are offered to multiple customers across different sites, while traditional outsourcing is more likely to be that the customer has a one-to-one relationship with the supplier and the application is often tailored to the needs of that customer. Since most ASPs invest in IT infrastructure and amortize their investments over a large customer base, they are sensitive to sustaining a critical mass of customers for financial stability [25].

Building on the early work, some researchers attempted to explore strategic drivers and antecedent conditions in making ASP adoption decisions, typically using surveys and interviews to identify key success factors related to the adoption decision; diffusion-of-innovation theory, motivation-maturity model, transaction cost theory, resourced-based view, resource-dependent view, and a knowledge-based view were used to determine ASP choice. For instance, Jayatilaka et al. proposed an integrated model that combined four perspectives to determine significant factors in

ASP adoption. They argued that each theory offered unique insight into ASP choice, but each had its own limitations. Based on their propositions, they found 8 significant factors.

Another research stream analyzed complex relationships between client and provider, and identified various types of ASP arrangements, such as strategic alliance and partnership. For example, based on a social theory perspective, Swinarski et al. investigated whether the quality of a partnership and the client's power had a significant effect on the service provider's compliance, cooperation, and commitment; partnership quality and client power were shown to make the service provider comply with the contractual obligations, cooperate, and invest additional resources into the relationship. Susarla et al. developed a conceptual model of satisfaction with ASP. They found, not surprisingly, that satisfaction with ASP was negatively influenced by the disconfirmation effect (discrepancy between the expectation and performance), but positively affected by the perceived provider performance and prior system integration experiences. Research that deals with ASP adoption is presented in Table 1.

Much has been said, but despite an abundance of theoretical perspectives in ASP adoption, apparently little has been done to assess the impact of ASP adoption empirically. We therefore felt that empirical research connecting emerging technology adoption with tangible outcomes was essential. Such a study could link ASP adoption with its benefits and provide a way of making future ASP-related decisions.

### 2.3. IT investment announcements and their impacts on the market value of the firm

In today's business environment, investment in IT has become an absolute necessity for organizations. Many companies need IT to attain their strategic goals as well as to improve operational efficiencies. While IT has been the largest capital expenditure for many organizations, determining whether investment in IT indeed contributes to firms' performance requires an extremely complex undertaking [9]. Much evidence supports the contribution of IT investment to firm performance but some studies suggest little or none. Over the past decade, there have been a large number of studies that have tried to address this problem [10,15].

To provide a different way of measuring business performance, some IS researchers have adopted a stock market valuation approach based on event study methodology, which is an efficient way to capture investors' overall assessment of a firm's value. Unlike the resource-based view approach, which uses annual financial measures, the event study measures the stock market's reaction to unexpected events, such as announcements, to estimate how the event impacts the value of the firm. The underlying assumption is that capital markets are sufficient to evaluate new information about the key event, including IT investment, which can potentially impact the expected future profits of the firm, and that this is reflected in the change of the firm's stock price. This methodology has been used in monitoring the effect of wide-ranging announcements, such as stock splits, layoff announcements, dividend policies, and key personnel (CEO) changes. Within the IS literature, the impact of unexpected announcements has been studied for IT investment in general [12], outsourcing [21], e-commerce, security vulnerability, knowledge management, IT infrastructure [3], ERP system [14], etc. There are different types of IT investments, but they can be divided into two parts: infrastructure and application investments. The impact of general IT investment on firm performance and the impact of IT infrastructure investments have already been examined, but our study is the first to investigate the impact of IT application investment (through ASP) on the market value of the firm. Also, we consider multiple contextual factors, such as strategic intent, firm

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