IT Application Outsourcing:
A Category and Evaluation of Application Service Providers

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Abstract

Information technology (IT) application outsourcing offered by an application service provider (ASP) enables businesses to move faster and reduce IT costs for e-commerce implementation. Small and medium-sized enterprises (SMEs) with limited IT budgets and little or no experience with application outsourcing, therefore, may opt into the ASP market at high risk and be unable to reap these benefits. This study provides guidance for SMEs to employ application outsourcing at reduced risk by enhancing SMEs' understanding of the difference between traditional IT outsourcing and application outsourcing, and the benefits that SMEs can perceive of using application outsourcing. Importantly, this study develops a framework for classifying the disparate applications offered by the ASPs, namely: network service providers (NSPs), Web developers, independent software vendors (ISVs), value added resellers (VARs), system integrators (SIs), content service providers (CSPs), managed security software providers (MSSPs), full service providers (FSPs), and ASP application aggregators (AAAs). It also identifies key performance criteria to evaluate the ASP offerings which are security, system integration, price structure, service level management, customer support, and functional service operation.

Keywords: E-commerce, application service provider, small and medium-sized enterprises, network service providers, independent software vendors, value added resellers, system integrators, content service providers, managed security software providers, full service providers.

Introduction

Many industry observers are predicting application outsourcing or e-sourcing to be the next big wave in outsourcing. E-sourcing to application service providers (ASPs), including Web-based applications, decision-support tools and associated services for e-commerce application, is expected to grow from $135 billion in 2001 to over $738 billion in 2005 at a compound annual growth rate of 52.9%. The Garner Group has predicted that most enterprises will rent software or use software services rather than purchase software and implement it in-house in the next ten years (Terdiman *et al.,* 2003). Key advantages to e-sourcing include the ability to reduce service and administration costs, and shorten time-to-market cycles (Aberdeen Research 2002; Travis 2000).

As outsourcing IT systems to ASPs enables businesses to move faster and reduce costs of IT investment for their e-commerce implementation, small and medium-sized enterprises (SMEs) with small IT budgets are demanding to acquire these advantages offered by ASPs. SMEs with little or no experience of IT outsourcing and ASP services, however, will face problems of identifying the right choice from diverse products/services offered by the ASPs, and may end up with non/under-performance of service providers. In addition, there is not much research on IT outsourcing to ASPs and particularly in small and medium-sized enterprises, SMEs (Dibbern *et al.,* 2004; Ekanayaka *et al.*, 2003).

Accordingly, this study seeks to address the following fundamental questions: which IT activities can SMEs outsource to ASPs? and which criteria can SMEs use to select the ASPs? Particularly, this study explores the outsourcing of IT/EC to ASPs in SMEs and provide guidance for the SMEs to enter the ASP market at reduced risks by enhancing SMEs' understanding of the disparate solutions offered by ASPs and key criteria for evaluating the ASP performance when selecting the ASPs. This study also fills the gap in literature as a few literature studies on the ASPs can be found in general and particularly in Thailand.

Application Outsourcing versus Traditional IT Outsourcing

A new emergence of ASP market leads to a wide variety of definitions of ASP among IT researchers. According to the ASP Industry Consortium, ASPs are the third-party service companies that deploy, manage and deliver application capabilities to many customers across Internet and wide area network (WAN). They can provide services from simply hosting a custom application online to providing a full IT infrastructure, which are generally supplied on a rental or lease basis. SMEs' data and applications are managed, stored, protected and maintained at an ASP's site other than their sites and are accessed securely either via the Internet or a virtual private network (VPN).

IDC estimates that the ASP market based on worldwide spending on software as a service and associated software licensing will growth from $4.8 million in 2003 to $13.4 billion by 2007 (Mizorus *et al.,* 2001). In a 2002 survey of 60 ASPs in 13 Asia-Pacific countries, IDC found that 77% of ASPs are targeting specific industries including retail, discrete manufacturing and financial services (Gupta and Herath, 2005). The ASP market is widely open for new entrants as a little or no value added (differences between competitors) is required. Most of early adopters are outsourcing non-critical systems such as desktop applications (email packages and messaging systems), web-site hosting systems, and e-commerce applications.

In traditional outsourcing arrangements, either a section or the entire business process is handed off to an outsourcing company which does not necessarily manage and deliver outsourced IT applications via a network. With the ASP model, the software and its required infrastructure are installed and managed at the ASP's site and their services are delivered through customers via a network. The ASP benefits from providing the standard application through many clients at standardized rental fees or "pay-as-you-go" basis. The relationship between other ASPs and customers is a key success element in the application outsourcing model. Table 1 summarizes the difference between traditional IT outsourcing offered by traditional suppliers and application outsourcing offered by ASPs.

Table 1. A comparison of traditional IT outsourcing versus application outsourcing

Items	Traditional outsourcing services offered by traditional suppliers	Application outsourcing services offered by ASPs
Outsourcing Model	Selective or total outsourcing	Selective outsourcing
Business Model	One-to-one or one-to-many	One-to-many
Service delivery	Not necessarily delivered via a network	Delivered via a network
System Ownership	Either owned by customers or suppliers	Owned by ASPs
Governance	Either externally or internally managed	Externally managed
Pricing Model	Custom or standard pricing	Pricing based on usage

Benefits of Using Application Outsourcing

A literature review reveals that SMEs gained significant benefits from the ASPs' solutions in various ways. For example, ASPs create enormous cost savings of 20-50% (DeZoysa, 2001) and allow SMEs to control their IT costs. SMEs have no more spending on high-end servers, security, backup systems and other hardware used in computer rooms. They can convert these capital intensive expenses into predictable monthly pricing plans offered by the ASPs. The need to have costly hardware and equipment on SME's premises as well as the big costs associated with set-up and maintenance are also removed. ASPs normally offer a higher level of security, information confidentiality and disaster recovery resources than SMEs can do. The responsibility of running and maintaining the SME's IT system is trans-ferred to an ASP's specialists ensuring that the system works all the time or at minimum downtime. In addition, SMEs are no longer required to update software and able to use the cutting-edge technology provided by ASPs.

Importantly, ASPs enable SMEs to assess to best technology, improve IT support, rapid implement of IT applications, integrate IT systems, access to IT experts, increase systems uptime, and reduce IT budgets that would otherwise only be in the hand of large corporations (Susarla *et al.*, 2001; Muller 2004).

Nonetheless, there are some disadvantages of using ASPs' services. SMEs normally must accept the ASP's application because ASPs can only afford a customized solution for the large-sized enterprises with a high IT budget. If SMEs depend on the ASPs to provide a critical business function, when the ASPs leave, they may not be able to handle that function and it results in a hold up problem to the SMEs.

Application Services Offered by the ASPs

To acquire the ASP's benefits, SMEs must understand which application services offered by the ASPs are available. According to many articles (e.g., Wikipedia 2005;
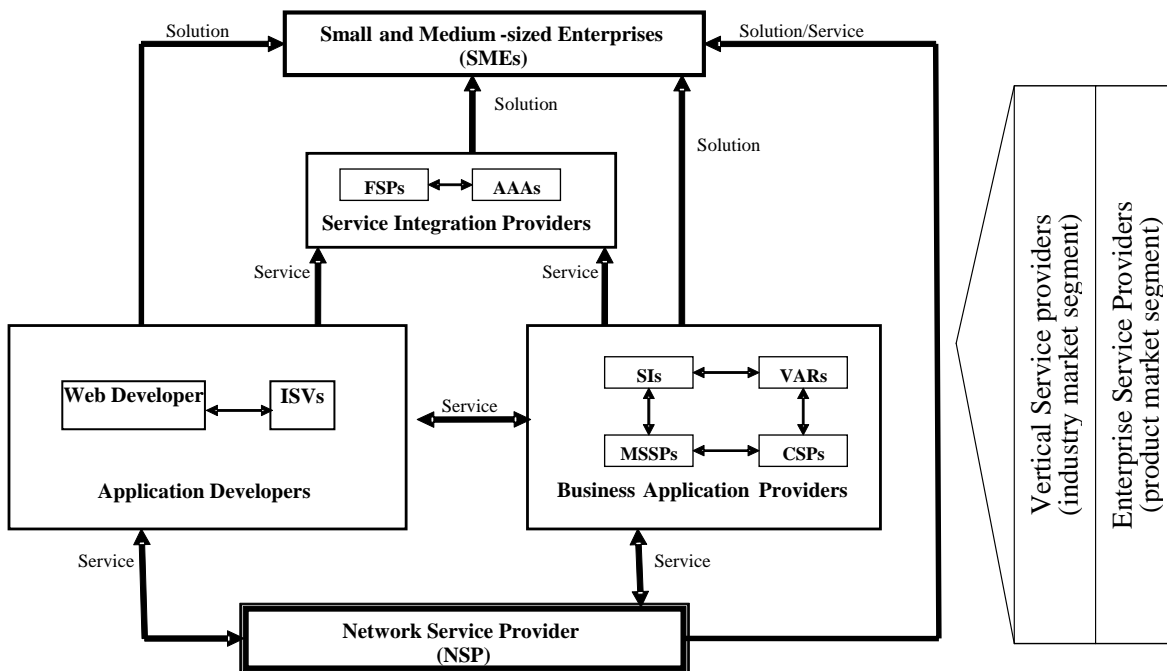

Fig. 1. ASP offerings based on their specialized services and market segments

Whatis.com 2005; ComputerWorld 2005; Ekanayaka *et al.*, 2003; etc.), there are many types of ASPs available in the market. This study develops a framework to categorize different application services provided by the ASPs (see Fig. 1). Based on a type of specialized applications provided, ASPs can be classified into four categories; infrastructure/network service providers, application developers, business application providers, and service integration providers. Based on market segmentation, ASPs involve vertical and enterprise service providers.

Network Service Providers (NSPs) supplies infrastructure to businesses by providing data centers, bandwidth or network and Internet connectivity to the ASPs. They are sometimes referred to as backbone providers or internet providers. Typically, they may own and operate data centers and offer managed hosting platforms that ASPs can use to deliver packaged custom software solutions. Even though NSPs usually do not focus on applications, at present they are moving towards the role of owning relationship with the SMEs (Ekanayaka *et al.*, 2003).

Application developers focus on the development of software application, and sales of packaged and custom application services. These application developers involve Web developers (WDs) and independent software vendors (ISVs). WDs incorporate all areas of developing a web site for the World Wide Web. This can include graphical web design, actual coding of pages, and web server configuration. ISVs specialize in making or selling software, usually for niche markets such as time scheduling, barcode scanning and stock maintenance. These application developers typically outsource their data centers, network, platform management and/or back office services to NSPs. They are often considered as "the ASP" because they often own the end relationships with the SMEs.

Business application providers offer consulting, systems integration, or other professional business services. They typically include value added resellers (VARs), system integrators (SIs), content service providers (CSPs), managed security software providers (MSSPs). VARs typically add some feature to an existing product then sell it as a new package to end-users. SIs typically integrate multiple systems for inputting, processing, interpreting, storing, and categorizing data. CSPs give customers access to specific content such as news, competitive analyses and streaming media. MSSPs install and maintain an integrated portfolio of security software and hardware that is pre-selected and integrated for each SME. Like application developers, these business application providers also can own the end relationship with the SMEs and outsource network and platform management to NSPs.

Service integration providers aggregate various ASPs' solutions and provide a total solution to their customers. These providers involve full service providers (FSPs) and ASP application aggregators (AAAs). FSPs offer a wide range of web-based IT services, including planning and creating a web presence, providing needed software, and hosting and maintaining a website. AAAs are portal companies that bring together not only a variety of content from multiple sources, but also applications and business analyses from multiple providers.

Fig. 1 indicates that the ASPs based on their specialized services partner with each others and share their services to provide a total and needed solution to their customers. For example, Cable & Wireless partnered with Microsoft and Compaq to provide the ASP's total solutions for SMEs. Cable & Wireless provided the network to deliver the ASP offerings while Microsoft provided the applications and Compaq offered the hardware to run the application. In fact, partnership among the service providers is a key success element in the ASP outsourcing model.

Furthermore, ASPs can be classified, based on market segmentation, into vertical and enterprise markets (Travis 2001; Wikipedia 2005). ASPs in a vertical market called vertical service providers (e.g., Velocity.com. and Trizetto) offer specialized or packaged applications for targeted industry such as claims processing for insurance companies and medical practice management software for healthcare companies. ASPs in the enterprise market or enterprise service providers (e.g., SAP, Oracle and Siebel) provide high-end

applications that may require customization such as enterprise resource planning (ERP), customer relationship management (CRM), and supply chain management (SCM) applications. These ASPs also offer professional services for design, implementation, and ongoing operation management.

In sum, there are many types of applications offered by the ASPs. SMEs should carefully outsource their required applications to the right ASP who has an expertise in that particular service and in the SME's business market (vertical or enterprise market) to avoid employing the non-performed ASPs. Nonetheless, there are many application service companies who can offer SMEs with the same type of application and in the same market. SMEs should know how they can evaluate each ASP performance to get the best supplier for their services. The following section will provide key performance criteria in evaluating the ASP.

Evaluating Application Service Provider's Performance

To select the right ASPs, some initial steps of ASP selection process must be taken. First, SMEs have to determine which software applications they need to host which may include web hosting, email, financial, accounting, e-commerce, enterprise resource planning (ERP), and productivity applications. These may be applications they are already using or new applications that will replace or improve their existing systems. Second, SMEs need to assess their internal IT capabilities which will help them to find the right ASP. For example, if they have IT resources that can answer application questions, they might not need to consider outsourcing or finding an ASP's support and help desk services. Third, SMEs must carefully evaluate performance of any potential ASPs in relation to their security, system integration, flexible cost structure, service level monitoring and management, customer support, and technical service performance including speed, reliability, availability and scalability (see Fig. 2) (Ekanayaka *et al.*, 2003; Currie and Seltsikas 2001; Greg 2000).
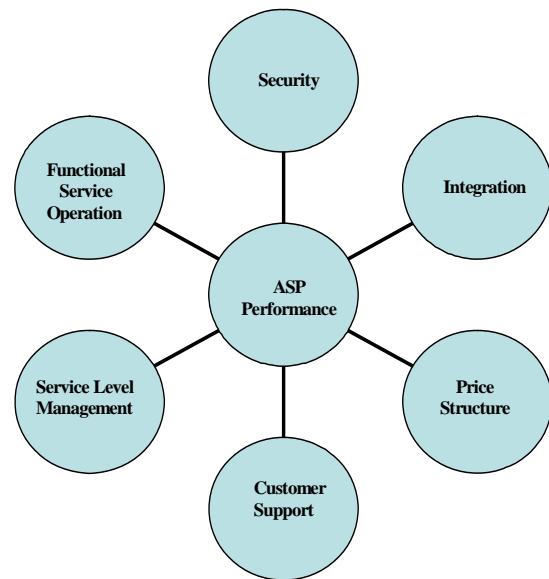

Fig. 2. Performance criteria for evaluating an ASP

Security

Normally, ASPs are able to provide an SME's service with satisfactory data management and security including physical security of data center, security of data and applications, automated back-up and restore procedures and disaster recovery plan (Currie and Seltsikas 2001).

SMEs might evaluate their potential ASP by considering the ASP's abilities to provide secure data transmission methods including hardware/software firewalls, virus protection software, public key infrastructure (PKI) and secure socket layering (SSL) techniques, and the ASP's abilities to offer the secure storage methods such as the frequency of back-ups taken, an off-site storage of back-up tapes and a disaster recovery plan. A secure system might also include tracking capabilities to provide a record of who has accessed, viewed, and/or edited specific or confident information. SMEs may also consider having an access the applications through the ASP's virtual private network (VPN) which available 24 hours per day, seven days a week, for monitoring of data centers.

Integration

The integration refers to the extent to which software applications can be integrated across business processes. SMEs should conceive of an ASP's abilities to share data between applications and automatically populate one application with data from another application (Greg 2000). They should consider whether ASPs offer an integration of various applications across multiple platforms, sites or environments, an interaction of applications to allow end-to-end analysis, and customization service if required by the SME. In addition, SMEs may want to look for the ASP's migration plan of existing data.

Price Structure

SMEs might consider whether ASPs can provide overall total cost reduction compared to in-house investment and offer competitive and flexible pricing models. There are many methods to pay a rental fee in different pricing models for the ASP's delivered application.

Pricing models that should be evaluated include the per-user, per-transaction, percentage-of-revenue, and fixed-fee models (Fran 2000). Per-user model is a flat fee per user suitable for frequent use of the ASP delivered application. Per-transaction model is a fee rate suitable for different automated functions or processes. Rates for each function such as registration, billing and account receivable functions are vary based on its processing and complicated data integration. Percentage-of-revenue model is based on the amount of revenue the user generates each month. The monthly fee will fluctuate according to the level of activity changes. Fixed-fee model is a lump-sum monthly fee that covers the ASP delivered services specified in the contract. This model is appropriate for the user who wants costs to be predicable.

In addition, SMEs should be aware of an additional monthly charge called an application management fee that covers the costs of operating and maintaining the application that vary with the level of support service the SME requests. Some ASPs may also charge one-time set up fees for implementation, system integration, training, and other necessary measures if the implementation involves complex processes such as real-time interfaces and customization.

Customer support

The ASPs can provide SMEs with help desk and training service including online support and documentation, and administration of accounts.

SMEs might evaluate the ASP offerings regarding the customer support in several aspects such as its available customer help desk, its average response time, its professional service through the quality of customer-experience, its reduction of queue time, its provision and frequency for training, and its on-line help tools. In case of evaluating an account administration support by the ASPs, SMEs may look at an average time taken to add users and modify accounts, an ability to view the SME accounts (e.g., log files and payment information), an ability to integrate billing information into management and reporting systems, and an average time taken to provide advanced notification to the SME for scheduled maintenance (Ekanayaka et.al., 2003).

Service Level Management

Typically, ASPs will provide SMEs with clearly defined performance metrics, a clear procedure for using their accounts, and a flexibility of service offerings including pricing, and contract length. They may offer guarantee security levels including service availability and disaster recovery and provide problem resolution to ensure a mutually satisfactory performance.

SMEs might evaluate the ASP offerings in regard to a guaranteed level of up-time and recovery of data, time taken to resume service after a disaster, and continuous measurement of performance metrics which offered by the ASPs. SMEs should acquire the ASP's penalty fees for a poor performance such as slow response time and down time, and might include escalating percentage of penalty fees each time the problem recurs. The service level

agreement (SLA) should clearly define costs and services provided by the ASP and the SME. If the SLA involves third parties or several ASPs to provide the separate applications such as data-center and web hosting application, it should be clearly indicate which ASP is responsible for each application when the problem occurs. SMEs should not attempt to lower monthly fees substantially as ASPs will cut service levels and the quality of their services. Importantly, SMEs should keep the contract term as short as possible because hosting and software associated with technology will change overtime.

Functional Service Operation

The system and applications of the ASP must be available, reliable and scalable. The network and software to conduct the SME's business should be available 24 hours a day, 7 days a week, and will not breakdown as a result of the ASP's poor engineering and support or bad weather.

SMEs may examine the system availability, reliability and scalability by considering the ASP's abilities to provide uninterrupted power supply, secure disaster recovery, and number of customers hosted from a single server configuration. They may need to evaluate the ASP's application architecture, bandwidth capacity, network availability, refresh time for a transaction, application response time, guaranteed level of up-time, and ability to scale to reasonable numbers (Ekanayaka *et al.,* 2003). SMEs might ask the ASPs to provide automatic application and network load balancing at acceptable capacity plan to ensure applications are available when needed.

Conclusion and Contributions

This study compares the traditional IT outsourcing services with the new form of outsourcing services, the application outsourcing or e-sourcing. It describes the benefits that SMEs can perceive of using an application outsourcing, develops the framework to categorize applications offered by the application service providers (ASPs), and identifies key performance criteria for evaluating the ASPs.

In particular, the study contributes to both practitioners and academics. For practitioners, this study provides guidance for SMEs with little or no experience in IT outsourcing and ASP services to be able to use the ASP solutions beneficially. It helps SMEs to better understand which ASP solutions are available for their e-business implementation. The developed framework describes disparate applications offered by the ASPs including network service providers (NSPs), independent software vendors (ISVs), value added resellers (VARs), system integrators (SIs), content service providers (CSPs), web developers (WDs), managed security software providers (MSSPs), ASP application aggregators (AAAs), and full service providers (FSPs). Some ASPs like vertical service providers and enterprise service providers offer services according to the industry and product markets. Each application offered by the ASPs will be appropriate for a particular business of a small or medium sized company. To minimize the risk of choosing the non- or under-performed ASPs, SMEs must carefully evaluate any potential ASP offerings regarding its ability to provide security, system integration, price structure, service level management, customer support, and functional service operation.

For academics, this paper might direct them to research toward an understanding of the ASP phenomena and the ASP offerings with up-to-date technology for SMEs.

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