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Application Service Providers (ASPs) and SMEs: An Evaluation of What ASPs Offer SMEs*

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Information and communication technologies (ICTs) play an increasingly important role in small and medium-sized enterprises (SMEs). SMEs can approach their ICT needs using Application Service Providers (ASPs). Using a taxonomy, this paper evaluates, from both the supplier- and client-side, three ASPs.

Keywords: Application Service Providers, SMEs

1. Introduction

Information and communication technologies (ICTs) play an increasingly important role in small and medium-sized enterprises (SMEs). ICTs can affect an SME's operational effectiveness, growth possibilities, competitive position, and overall firm performance. A major problem for SMEs is how to acquire appropriate software and hardware as well as how to develop or acquire capabilities to deploy ICTs in effective and efficient ways. It has been argued that Application Service Providers (ASPs) can provide SMEs with appropriate ICT resources and capabilities. ASPs is an organizational information systems approach based on that organizations buy or rent their ICTs and services over the Internet rather than owning and maintaining their own hardware, software, and computer-based information systems. It is predicted that previous proprietary architecture—where companies built and maintained unique internal information systems (IS)—will to a growing extent be substituted with an open architecture where companies can rent data storage, processing power, specific applications, and other services from different types of external service providers. This approach makes it possible for SMEs to, at decreased costs, get access to hardware and software without owning them. It also means a possibility for SMEs to get access to knowledge crucial for deploying hardware and software in an effective and efficient way. Generally, ASPs and the outsourcing market have primarily targeted large organizations, but increasingly we see that SMEs are targeted. The literature suggests that studies focusing on ASPs and SMEs are sparse.

This paper is an evaluation of ASPs for SMEs. A framework for doing an analytical categorization and evaluation of ASPs is used (Currie & Seltsikas 2000). The framework consists of four distinct categories: delivery, integration, management, and enablement. Associated with these categories are performance criteria for evaluating ASP offerings. We present the framework and use it in our evaluation. Based on the evaluation we propose some extensions of the framework.

* The authors contributed equally to the paper.

The purpose of the paper is twofold. First, to describe if and when ASP is plausible for SMEs to in- or outsource ICTs and IS. To make informed and well-grounded ASP-decisions, SMEs must know what ASPs offer. We will look at what ASPs offer from a client (SMEs) perspective. This is associated with the delivery category in the framework. Second, to describe how ASPs use new ways to enable and support services needed by SMEs. This is associated with the integration, management, and enablement categories. The new ways to enable and support services will be evaluated.

The remainder of the paper is organized as follows: the next sections give a short introduction to outsourcing, ASPs, and ASPs and SMEs. It is followed by a description of the framework to be used. Section 6, using the framework, presents and evaluates three ASPs. The final section presents conclusions and discusses future research.

2. Outsourcing

The outsourcing market is vibrant and receives a great deal of attention. Predictions suggest that the market will continue to grow (Edenholm 2002). ICT-outsourcing reports have focused on the market for large companies like EDS, IBM and their customers. Research on ICT-outsourcing has primarily focused large organizations—see for example, Lacity and Hirschheim (1993), Pinnington and Woolcock (1995), and Willcocks and Choi (1995). A primary finding of this research is that the relationships between ICT-sourcing participants determine the difference between a successful, less successful, and a failure sourcing deal (Kern & Willcocks 2000; Klepper 1998; Lee 2001). Although outsourcing has got a large attention in recent years, outsourcing is not a new phenomenon. As early as the mid-1960s there were computer service bureaus that ran a variety of systems for external clients (McFarlan & Nolan 1995). These systems were mainly financial and operational applications. And, since Kodak decided to rent their ICT resources from an external partner in 1989, there has been a trend towards ICT outsourcing (Hirschheim & Lacity 2000). Many large companies have decided to transfer their ICT assets, leases, and staff to a third part (Lacity & Hirschheim 1993). ICT outsourcing is varying a lot. Some companies outsource just a few ICT functions while some companies outsource their entire ICT operations (McLellan et al. 1998). According to McFarlan and Nolan (1995), ICT outsourcing is a harbinger of transforming the traditional ICT departments, providing a glimpse of the emerging organizational structures of the information economy.

In recent years we have in the outsourcing market seen a growing number ASP start-ups and companies offering their products and services through the ASP concept (e.g. Intellinet, TeleComputing, Genesis-IT, SYSteam, Kebne, IFS, IBS). ASPs is often seen as a way for SMEs to get the possibility to use ICTs to increase their effectiveness and efficiency. But, what exactly is ASP and why should SMEs use it?

3. Application Service Providers

ASP can be seen as a selective ICT outsourcing. The core of ASP is the handling of applications to external costumers. They can be ICT related, but this is not the only thing that an ASP may offer. An ASP service can, for example, be some kind of information broker. Puelz (2001) describes an ASP which benchmarks data from 16 financial institutions.

However, ASP is commonly associated with the offering of software applications (Cherry Tree 2001; Kern et al. 2001; Currie & Seltsikas 2000). The offering consists of managing and delivering software applications to external clients. The clients use the applications in their own business and application areas such as, web-site hosting, payroll/billing, e mail, e-commerce, and Enterprise Resource Planning (ERP). ASP is sometimes defined as a form of application outsourcing. Said Currie and Seltsikas (2000 p.1): “an ASP manages and delivers application capabilities to multiple entities from data centers across a wide area network”. A slightly different definition is given by Kern et al.: an ASP is “a supplier that provides access to centrally managed applications on a rentable or pay-as-you-use basis. Applications are then delivered in a one-to-many arrangement by suppliers to (multiple) users from a shared data-center over the Internet (or other networks) and are accessed from the customers’ desktop via an Internet browser.” (Kern et al. 2001 p. 10).

The ASP phenomenon can also be addressed from a business model perspective. Lockett and Brown (2000) characterize ASPs as intermediaries enabling the digital enterprise community. They suggest “eClusters” as a construct reflecting this. eClusters are made possible by new development of ICTs. Viewing ASPs as intermediaries transferring new business possibilities, given by the development of new ICTs, to clients and customers explain some of the differences between the “old” service bureau concept and the ASP concept. Lacity and Willcocks (2001) also describe ASPs as intermediaries between client organizations and independent software suppliers. The use of sub-contractors in ASPs is a thing Lacity and Willcocks (2001) emphasize. They refer to investigations stipulating that 36 to 50 % of ASP services was delivered by sub-contractors. The sub-contractors are hired by the suppliers to deliver part of the services to the customer. The customers have limited or no interactions with the sub-contractors. Quite often the customers do not even know that there are sub-contractors involved (Lacity & Willcocks 2001).

Currie and Seltsikas (2001a) call ASP the third wave of ICT outsourcing. The first wave was technology-centric with few additional services. The second wave was business-centric, which mainly consisted of transferring responsibilities from technical staffs to general or line managers. ICT outsourcing has now reached the third wave, which Currie & Seltsikas (2001a) calls industry-centric. They mean that outsourcing has shifted from centralized computing (1960s and 1970s) through distributed computing (1980s and 1990s) to remote computing in the 21st century. In the latter, ASPs will play an important role since they offer a utility model that consists of applications on a pay-as-you-go basis. ASPs is also a one-to-many model, where a specific application will be shared by a number of customers across different locations.

Having defined ASP, part of our question remains: why should SMEs use ASPs?

4. ASPs and Small and Medium-Sized Enterprises

Kern et al. (2001) point out three SME-related ICT-problems ASPs can solve. First, even though a packaged software license is cheaper than an in-house developed application, it is still the case that many SMEs cannot afford the packaged solution costs. Second, most SMEs will be unable to attract and pay required ICT staffs. Third, packaged applications require an established ICT infrastructure as well as a fairly high degree of connectivity to ensure optimal performance. For most SMEs it is difficult to develop and maintain such ICT infrastructures. ASP can assist SMEs with ICT skill, especially in the development and software maintenance

areas (Kern et al. 2001). ASP can also make it possible for SMEs to take advantage of the rapidly changing opportunities provided by new ICTs (Turban et al. 2001; Currie & Seltikas 2000).

Dewire (2001) argues that there are eight different reasons for why an organization should consider using ASPs:

- The organization is a start-up and do not have the capital resources to make significant ICT investments.
- The organization is undergoing rapid growth and needs to scale its ICT infrastructure quickly.
- The organization is undergoing mergers and acquisitions and needs a flexible ICT infrastructure.
- The organization can not afford a huge ICT capital outlay at the time.
- The organization need to be able to switch to another environment in the near future.
- The organization need to deploy applications rapidly.
- The organization is finding it difficult to attract and retain ICT staff.
- ICT is not a core competency.

The first and third reason could be compared to what Willcocks and Lacity (1998) calls transitional outsourcing. Transitional outsourcing is when an organization temporarily outsource, or a better word is probably insource, something. This is done during the time for a major transition to a new technology.

5. The Framework

Currie and Seltikas (2000, 2001a, 2001b) has developed a framework for evaluating ASPs. The idea about the framework is that it should help to describe, categorize, analyse, and evaluate the ASP phenomenon. The main idea is to see what services the ASPs offer and how the services are delivered. A taxonomy is used to categorize ASPs. ASPs can be categorized in five different groups according to what product(s) they deliver. The five groups in the taxonomy are:

- *Enterprise*, which means “big” companies in the Enterprise Resource Planning (ERP) market. These companies have big companies as their target market. The reason for them to become ASPs is that they hope to be able to deliver their ERP-systems to SMEs. This means that they will be able to broaden their marketplace. The product and services they deliver is related to ERP-systems.
- *Pure-Play*, which means companies offering only solutions that are web-enabled. The main target for them is primarily dot.com and other start-up companies.
- *Vertical ASPs*, which means companies focusing a specific market. Here, market is a limited service or product, for example, car manufacturing, credit institution or insurance company.
- *Horizontal ASPs*. As opposite to the vertical ASPs the horizontal ASPs do not support a specific market. Instead they support a client with all the applications the client needs. The main products a horizontal ASP delivers are tools supporting collaboration. The main target for them is in the area of SMEs.
- *ASP enablers*. This group is actually not an ASP. They are companies that support other ASP companies with products and services necessary for their businesses.

An analysis and evaluation of an ASP is done using a framework consisting of four categories:

- *Delivery*, which, in part, is related to how ASPs market themselves. It is also concerns what services and products they offer.
- *Integration*, which focuses two essential elements, infrastructure and synergy. The infrastructure is about how the hosting of applications results in greater manageability. The synergy is about how the integration and bundling of applications creates more complete business solution and add value to the customers.
- *Management and operations*, which is about how the hosted application infrastructure is managed. What the ASPs actually do and how they do it. A question in this area is, for example, how customer services will be monitored.
- *Enablement*, which is mostly about how to monitor and measure performance, for example, what tools and services do ASPs deliver to increase the productivity for their customers.

6. Evaluating Three ASPs

This section presents and discusses a study of three different ASPs. Each ASP is classified according to Currie & Seltsikas categorization of ASPs. We also describe customers to two of the ASPs. This section is based on interviews done at the five companies as well as on documents related to the companies.

6.1 The Horizontal ASP

The horizontal ASP-company (HASP) is a consultancy firm located in Denmark, Norway, and Sweden. The company is the result of mergers of three different companies--the three companies were an Internet Service Provider (ISP), an IT-consultancy, and an ASP-firm. The HASP-company offers flexible solutions to its costumers. A solution can consist of a base block and/or a customer specified solutions. The base block is Microsoft's Outlook, Explorer, Office, Project, and WinZip. A customer specified solution could, for example, be payroll/billing, e-commerce, and ERP applications. At the heart of the company stands the company's data center. According to the company, its data center in combination with ISP service and IT-consultancy experiences make the company well positioned to become a competitive player in the ASP market.

The interviewee frequently referred to the ASP concept. In his opinion it is implicit that ASP is about leasing out IS in the form of applications and that the basic idea is that ASP is a one-to-many solution. It is a centrally coordinated solution where servers are placed at the HASP-company and all data processing take place there. The HASP-company is in charge of all systems support and maintenance, including both daily maintenance as well as irregularly maintenance as version updates.

The company also offers a variant where a server can be placed at a customer site. Daily maintenance will then take place at the customer site. Maintenance can be done by the HASP-company or by the customer. In the former case it can be that the HASP-company is responsible for backup management (an ASP service). The HASP-company makes the backups and saves the backups on a server situated at the company.

The HASP-company wants to disconnect itself from the ASP label, primarily because some customers have negative perceptions of ASP. It is also felt that ASP definitions are too narrow

to describe what the company is actually offering. It considers itself an “operational-solutions” provider. The operational-solutions consist of two parts. The first part consists of a standard assortment of applications, i.e. a base block that all customers need. As described above, this base block consists of Microsoft products. The base block can make it possible for the HASP-company to increase its volumes and to make a profit. The second part is customer specific applications that a customer either already has or wants to have.

SMEs is the company’s market segment and SMEs are targeted using two channels: through own activities and through partners. In the latter case a partner identifies a customer and when the partner markets a system, e.g. an ERP system, it also offers the operational management of the system. The partner can sell the systems and make an agreement about the maintenance of the system, but the HASP-company will fulfil some of the promises made to the customer.

According to the HASP-company, the main reason for using an ASP is cost control. The interviewee described customers’ ICT cost control and awareness as very low. The HASP-company uses a total cost of ownership (TCO) analysis to describe to customer its present ICT cost. The figures can be compared with what an ASP solution will cost.

The HASP-company sees two main reasons for a customer not to choose an ASP solution: 1) security concerns, and 2) data control concerns.

6.2 The Vertical ASP

The vertical ASP “company” (VASP) is a subsidiary of a larger consultancy firm located in Sweden. The consultancy firm consists of a lot of different departments, where each department is focusing a specific market. The role of the VASP-department is twofold. First, to be a supplier to other departments in the company. When other departments sell a system or a system-licence they can also propose to the customer system support and management. This service will be done by the VASP-department. Second, the VASP-department markets and sells products using internal sellers and external partners.

The VASP-department offers three different products:

- *Outsourcing*, which means that the department provides customers with a platform for their systems. They also supports and manages these systems. Hence, supporting and taking full responsibility for these systems. The VASP-company owns the systems and the equipment and customers pay a monthly fee for using them.
- *Hosting*. The difference between hosting and outsourcing is that in the hosting case the customer owns the systems. The VASP-department provides a customer with storage space and processor power. For this service a customer pays a monthly fee.
- *Service provider*. In this area there are two different offerings which the company calls ASP: 1) pure ASP, 2) and customer specific ASP. A pure ASP is a part of the department’s portfolio. If a customer wants an application not in the portfolio it will be a customer specific ASP. The department will deliver this offering only if the department is allowed to do some tests beforehand and allowed to manage the application on its servers. For this service a customer must pay for the use of the whole server even if only a smaller part of the server is used.

The difference between the services and products is a bit blurry, and it is hard to find out the exact differences. The services delivered in all the cases are different types of support and management of applications. These applications are web-site hosting, payroll/billing, e-mail, e-commerce, and ERP-systems. The VASP-department limits its offerings to in-house

developed systems and systems it has enough competencies on. With enough competencies is meant that the department does not have to depend on any external partner to manage the systems.

The VASP-department's market segment is SMEs. SMEs are targeted using two channels: through own activities and through partners. The former is through own activities, both at the VASP-department as well as other departments in the company. The second channel is through the use of partners. These partners are reseller of the company's products and the idea is that when partners sell applications they should also be able to sell system support and management.

6.3 The Enterprise ASP

The enterprise ASP (EASP) is a global company operating in the ERP market. The company develops and markets its own ERP-system. They sell, license, implement, and support the ERP-system. The company started a new department 1998 which marketed itself as an ASP. But, it was not until 2000 it actually started to do business as an ASP. The reason for starting an ASP business was to become a more interesting partner for its customer. The EASP-department also wanted to take part of the expenses that their customers put on system support and management. When the business was started it was with the intention to be a horizontal service provider, offering all the systems the customers needed. There are two reasons why this has not been fulfilled. The EASP-department planned to use a partner operating as a horizontal ASP, but the partner went bankrupt. The department also found out its customers did not appreciate the horizontal service provider offering.

Currently, the department only offers an ASP service for its own ERP-system and a selected group of systems related to the ERP-system. These selected systems are EDI systems and systems for managing printouts.

Three different products are offered:

- *Hosting*, which is a proactive supervision and management of a customer's ERP-system. The customer is connected to the company's data centre. The equipments are normally owned by the ASP-company, which guarantees an accessibility of 99.9 % or 99,5 %—based on customer choice.
- *Remote Control*, is the same thing as hosting, but with the difference that a customer owns all equipments and that these are located at the customer's place. The ASP-company does the same proactive supervision and management as in the hosting case. The difference is that it is remotely done.
- *RentIT*, is according to the interviewee the closest to ASP the company gets. In this case a customer wants and is offered everything around the ERP-system and the customer pays a monthly fee for this. In this offer the ASP-company includes, licence fee, hardware, user education, maintenance, supervision and management of the ERP-system.

The support the ASP-company offers consists of two parts. The customer has access to complete support and immediately correction of error between 07:00 and 22:00. The rest of the day there is a telephone support open all round the clock and the customer can report errors and have simple errors corrected. The ASP-company reports every month to the customers accessibility-figures. It also reports what errors the customers have reported and what actions the ASP-company has taken.

The customer segment is medium to big sized enterprises. By becoming an ASP-company it also want to be a possible partner for SMEs. The ASP-company wants as many as possible of their customers to join the RentIT idea. RentIT is mostly a way for customers to finance investments. Instead of paying a licence-fee cash, customers get the possibility to pay the investment as a monthly fee in 36 months. One reason for why the ASP-company wants the customer to use RentIT is that it seems to increase customer satisfaction.

6.4 The Travel Agency

The travel agency is a small firm selling and arranging sports and concerts trips and it has been in business since 1997. Today they cooperate with the vertical ASP-company (Sect 6.2), which they have done since 2000. They are connected as an ASP customer to them. The systems that they use and rent is Microsoft Office and TOIs. The latter is a booking and reservation system for travels. This system was at first handle as a customer specific ASP, which means that it was running on an own server at the ASP-company. After a while the ASP-company moved this system to an server where there are other enterprise systems running and the travel agency become a pure ASP customer. This also meant that the monthly fee decreased by 20 %. The connection with the ASP-company is through a 10 Mbit connection (this VPN connection is not included in the deal). The reasons for choosing such a powerful connection is that the owner wants to have the possibility to grow. Another reason for choosing this connection was the fear that it would work “stiffly” otherwise.

The company has telephone contacts with the ASP-company almost every day. They are paying for full services with immediately correction of errors (between 07:00 and 17:00 every normal working day). They do not feel it is necessary and not worth the money to have support the rest of the day. They receive a report every month stating what accessibility time they have received. At the moment the find the accessibility time very good. They are not sure but they think that the contract state that they will have 99.5 % acessability time. They do not really trust how this is measured by the ASP-company and register themselves when and how long they have been disconnected. This is according to the interviewee not actually a problem. They have so far been compensated for the time they have been disconnected.

The biggest problem with the services from the ASP-company is the network connection. The ASP-company is responsibility, despite that this is not part of the deal. This do that there have been occasions when the ASP company have blamed the supplier of the network connection for errors, and the travel agency is not able evaluate if this is right or not.

6.5 The Manufacturing Company

The manufacturing company is a global company that delivers equipments to the pulp industry (in business since 1899). They operate globally with own offices in the Nordic countries, and with representatives outside the Nordic countries. All offices in the Nordic countries are connected to the head office in Sweden. The connections are 128 K ISDN, 64 K Frame Rely or 56k Dial In ISDN. Today they cooperate as an ASP customer with the enterprise ASP (Sect 6.3). They have done this since the beginning of 2000. Before that the used the same ERP-system, but they did all the support and services themselves. This was working very well and they had very little problems with the system. Despite this they decided to rent the ERP-system from the enterprise ASP. There were mainly two reasons for doing this. First, the company’s system started to run “stiffly”. They discovered that they have to change server every second year if the system should run smoothly. They had at this time worked with this system for a little more than two years. Second, it was hard to update the system and keep enough knowledge about the system in the company. At the same time

the enterprise ASP started its business and the company decided to try this. They are connected to the enterprise ASP with a 10Mbit connection (included in the deal). All use of the ERP-system is done through an internal network, where all the company's offices are connected. This internal network is then connected to the enterprise ASP. The manufacturing company supports and manages the internal network and all systems excluding the ERP-system. The connection to the ERP-system is through a Citrix sever (included in the deal).

The services that they receive from the enterprise ASP today is, beside the support and management of the ERP-system, a web-hosting service. They pay a monthly fee for this and the fee is based on number of users. They pay for at most 40 users at the same time, but there are 60 possible users at the company. The reason for this choice is that the cost for each user is quite high, and the users do not have to be able to use the system all day. To manage this in an effective way there is a function that disconnects a user when the user has been inactive for more than 15 minutes.

The company has access to a telephone support open all round the clock, which they report errors to. They have complete support and immediately corrections of errors between 07:00 and 22:00. Contacts with the enterprise ASP are always through the same person at the company. This person is also the only ICT -employee at the company.

The company receives a report once a month. This report shows what errors have been reported from the customer. It also shows errors that the supervision of the system has detected. For every error there is a description of the error and what action it resulted in. The report also shows what the accessibility time has been. In spite of the fact that the ICT-employee is technically acquainted, he feels the reports are quite useless and has a hard time to understand the meaning of some figures and graphs.

7. Discussion

There is an opinion that the most common way to receive services from ASPs are through the Internet. This is not the case here. The ASPs as well as the customers found it inappropriate to use the Internet. Two reasons for not using the Internet were expressed: security and Citrix. The security reason is probably a question of education in the customer case. The Citrix case is more complicated. All of the three ASPs in this investigation use Citrix server and Citrix clients for connecting the customers. They also claim that most of the problems that they have is because of Citrix. The reason for not using the Internet, when using Citrix, is according to the ASPs that Citrix is very dependent on a stable connection. One may wonder: why use Citrix at all? The answer is that there probably are no alternatives.

There are also some problems with integration between systems that must be taken care of. The manufacturing company exemplifies this. They get their ERP-systems delivered as an ASP service. In the system there is a function making it possible to export data from the ERP-system to Microsoft Excel. But, when the ERP-system is handle on a server at the ASP and the customer does not rent MS Excel this is not working. This function worked before and the manufacturing company grasp this function as a function consisting in the ERP-system. The enterprise ASP implemented Excel on the server so this is now functioning. Still there is a problem with it, because the users can work with Excel as long as they are connected, but they cannot save the work done in Excel.

The study shows that the choice of a partner as an ASP is mostly based on the reputation of the ASP firm. Both the ASPs as well as their customers express this. The customers do not emphasize the contact with the ASPs as long as the services, in this cases the system, are working. The customers do not put so much attention on feedbacks from the ASP-companies. The reason for letting external partners take care of their ICT-assets is mainly an idea of concentrating on core competencies. This means that as long as the systems are working and they receive what they are paying for they are satisfied. They actually want to see and hear as little as possible from the ASP-companies.

There is in both customer cases an opinion that accessibility time is not measured in the right way. They think the figures the ASP-companies present are not reliable. A reason for this is the ASP-companies do not manage the network connection in these cases.

8. Conclusion and Further Research

Two tentative conclusions can be drawn. First, the Currie and Seltsikas (2000, 2001a, 2001b) taxonomy should be expanded by a discussion about if the products that are delivered are developed by the ASP-companies or not. This will make the categorization of ASPs clearer and it would be easier for a customer to make a choice between different ASPs. For customers this means that they when going into a relationship with an ASP they know if they are also dependent on other partner or not. Second, how accessibility time is measured and how action is taken when the time offer is not fulfilled is an issue expressed by both partners. The customers feel that further cooperation might be in danger if this issue is not solved. Finding methods for how to measure accessibility and explain how it is measured should be a vision for ASPs.

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