

An Exploration of the Application Service Provision Outsourcing Option

Thomas Kern
Erasmus University Rotterdam
tkern@fbk.eur.nl

Jeroen Kreijger
Trilogy Corp.
jeroenk@gmx.net

Abstract

The third wave of IT outsourcing has reached small, medium-sized, but also large organisations, with a storm of interest via the Internet, in form of application service provision. Application service providers (ASPs) offer multiple users a subscription-based access model via the Internet or a virtual private network to centrally managed applications. The appeal of ASPs are the per-user-pricing models, accessibility to applications and capabilities, and value-added management services. This paper argues that although ASPs offer an electronic solution, it does not differ much in practice from classical outsourcing practice. Using a conceptual contingency model that combines resource dependency theory, resource-based theory, transaction cost theory and agency theory this paper explores the ASP option in a number of case studies.

1. Introduction

Application service providers (ASP) are the harbingers of the third wave of information technology (IT) outsourcing. Their recent rise as service firms that provide on a contractual basis, rentable or 'pay-as-you-use' access to centrally managed applications made available to multiple users from a shared data center over the Internet or other networks, did not exactly come unexpected. In fact, in many ways ASPs characterize the current paradigm shift in how organisations procure the necessary technology, competencies, resources, and expertise to effectively respond to the increasing market demand of being e-business ready. Driving this shift on the one hand are underlying technology developments such as the rapid maturing of the internet as a reliable and secure network, the acceptance of browsers as the new application interface, the increasing adoption of server-based computing (i.e. network computers and thin-client server systems) and the high demand for complex electronic commerce, supply chain management and customer relationship management applications. On the other the current market situation sees a large shortage of

fundamental IT and application skills, an increasing demand for value added IT services, decreasing software release cycles and the resulting pressure of regular upgrades.

With more than an estimated 300 firms fitting the ASP definition today, and a predicted 91% [7] annual growth rate reaching an estimated \$22bn market size in 2003, this service [4, 5] defines for many interested parties an attractive new sourcing option. At present, the ASP market consists of a diverse range of established and new start-up service firms, including internet service providers (ISPs), telecommunication and network infrastructure providers (Telcos), independent software vendors (ISVs), online software companies, system integrators and outsourcing service vendors. Together they offer access to an immense array of applications, and indeed a number of enterprises such as AltaVista, BASF, Levi's, and Arthur Andersen, to mention just a few, have already signed short and long-term contracts with ASPs. At present most media attention focuses on the fast growing US ASP start-ups such as Corio, Usnetworking, and Futurelink, although the market will see in its maturing phase an aggregation shift as large outsourcing providers, such as IBM, EDS and CSC determine their ASP strategy. These firms will be able to offer those kind of resource capabilities, expertise, technology and geographical presence that will make the ASP business model an attractive option to the global fortune 1000 businesses.

The objective of this paper is to investigate ASPs potential to be leveraged as an outsourcing option. In particular, the research focuses on the considerations that potential customers need to take into account if their goal is to outsource with an ASP. There is little research available on ASPs, especially in terms of decision and selection criteria. More importantly, our research revealed a lack of a theory that could be used to analyse the ASP sourcing option. As a result, we applied a theoretical outsourcing framework by Cheon, et al (1995) that integrates resource-based theory, resource dependency theory, transaction cost theory and agency theory, but has never been used to explore empirical research to date. Nevertheless, we employ their framework, arguing that in essence the conceptual framework covers those strategic,

business and financial factors which are often associated with outsourcing as the primary motivators [see 15, 18].

For practitioners this paper will be of particular interest as it explores the ASP model in terms of products and services offered. In addition, a set of business, strategic, technical considerations are identified that can help guide interested companies in their evaluation and decision making process about whether to opt for an ASP or not. The outcome should put potential customers in a better position to define fundamental selection criteria of both applications to outsource and which ASPs defines the best strategic match for their requirements.

The remainder of the paper is structured as follows. The first section provides an overview of the ASP option in terms of benefits and potential risks, before outlining in the second section the theoretical framework. Combined the sections then lead us to formulate a number of propositions, that inform our research design and define the basis for the ensuing case research in a number of ASP companies. Following a analysis and discussion section of the case studies along the propositions, we round off the paper with a number of management implications.

2. The ASP Option

Core to the ASP option are the various applications that a provider can offer from its centrally managed server farms over a network. Being able to host and offer these applications to many potential clients defines the underlying business logic behind the ASP option. By operating a one-to-many business model ASPs can achieve economies of scale in terms of applications, network costs, server technology and implementation expertise.

As such the ASP concept is simple in its set-up. It entails the hosting and provision of the applications to customers, the actual servers on which these application reside, and the network connection that enables the delivery of the application over a network. As with outsourcing, ASPs define their product services with customer-specific Service Level Agreements (SLAs). SLAs define the basis of the Client-ASP relationship and function as a guarantee for the availability and performance levels of the application services.

The type of application and its importance for the customer influences the type and level of application service required by the customer. An exploration of the current product and service offerings of a large cross section of ASPs indicates that a wide range of business applications can be accessed through an ASP model. The primary element of the product offerings are formed around the application portfolio and its management [4]. Applications in general are said to support or enable

certain business processes in organisations. When these applications are then grouped according to business processes, the following types can be identified as being currently available from ASPs:

2.1. Benefits and Risks of the ASP Option

The rapid growth of the ASP market suggests that companies must perceive ASPs as offering substantial benefits. However the claims and benefits touted at present cannot be substantiated by experience due to the lack of long-term customer case studies. Nevertheless, this section provides an overview of the most common benefits the ASP model is expected to provide, which is contrasted with the inherent risks uncovered (see table 1).

The primary business benefits revolve around two main aspects: ASPs reduce the need to retain in-house IT professionals and ASPs provide access to the latest applications of any complexity. The inherent business risk though relates to the loss of control over application management, and the yet unproven ASP concept in general. Secondly, the technical benefits touted by ASPs are probably the most compelling. The main argument being that any problem associated with the use of applications to support business operations can be overcome by working with an ASP. However, there are in parallel a number of technical limitations such as network bandwidth and issues of security, scalability and reliability that demand careful consideration. Finally, ASPs offer a number of economic advantages. The pricing model of ASPs enable predictable and controllable usage and application costs. On the other hand it is unclear what pricing looks like when technology or business needs change.

In any case it is clear that just as has been the case with IT outsourcing, the ASP solution might not be the right choice (1) for all business needs and companies and (2) under all circumstances. Secondly, there is no certainty that making use of an ASP automatically generates the (dis)advantages. It is yet unclear how the benefits are realised and the risks are best mitigated. Lastly, the specific benefits and risk are also dependent on the actual ASP offering and its IS capabilities.

Furthermore, to put the benefits and risks into perspective, a recent survey of 250 IT managers by InformationWeek [17] revealed that 30% are already renting or leasing applications from a third party and an additional 14% planned to do so in the near future. The major reasons to use an ASP was dependent on the companies size and application needs. Larger companies sought an ASP that understood their business and the impact of the applications, while smaller companies found the low up-front investment and the range of services provided particularly attractive. The main benefits pursued by all where guaranteed performance levels, fast

Type	Benefits	Potential risk
Business	Reduces the need to attract and retain skilled IT professionals	Loss of control and high level of dependence on ASP
	Enables company to concentrate on strategic use of IT	Inability of ASP to deliver quality of service: lack of skills and experience
Technical	Enables small and medium sized companies to use tier-1 applications (e.g. ERP, SCM & CRM)	
	Application scalability enables rapid growth of companies	
	Fast and easy application deployment	Level of customisation and legacy application integration offered by ASP is insufficient
	Higher degree of application standardisation	Reliability and speed of delivery due to bandwidth limitations
	Access to wide range of applications	Low capability of ASP to deal with security and confidentiality issues
	Application maintenance simplified and performed by ASP	
Economic	Simplified user-support and training	
	Low total cost of ownership	Pricing changes by ASP unpredictable for application updates and services
	Low up-front investments in hardware and software	
	Improved cost control as result of predictable subscription costs	

implementation, scalability, predictable costs, service expertise and guaranteed application uptime. However, the main concerns raised was the uncertainty whether the claimed cost advantages can actually be realised.

The survey provides some indications of the rationale behind the decisions whether or not to use an ASP. It remains a question whether the reasons provided are applicable in all situations. It also does not describe under what conditions the benefits can be realised. The size of companies, capability and offering of the ASP, and the type of application sourced all seemed to influence the fit of outsourcing applications to an ASP. Taking these notions and the overview provided above into consideration, a number of propositions based on the analytical framework discussed in the next section can be formulated.

3. Towards an Analytical Framework to Explore ASP Sourcing Decisions

Best practices revealed that firms considering an outsourcing option need to perform a thorough evaluation process to come to a weighed decision and sourcing strategy [25]. To date, IT outsourcing has been evaluated through several theories including transaction cost theory (TCT), resource dependency theory, agency cost theory, political theory, social exchange theory and others [9]. The most prominent being TCT. Yet researchers have argued that the underlying financial reasoning is insufficient to understand outsourcing decisions [10, 14]. In turn, a broader perspective integrating multiple approaches needs to be adopted that explains, as McLellan et al. (1995) point out, why companies form IT outsourcing alliances for financial *and* strategic reasons.

For the same reasons as the former authors testify, this research adopts the multiple theory framework by Cheon et al. (1995), which we found to offer a solid base for a comprehensive study of the ASP phenomenon.

Cheon et al. (1995) use four distinct theories from two different disciplines (strategic management and economic theory) which they integrate into a contingency model and argue should then guide empirical research on IT outsourcing. The four theories that they integrate in the model are resource-based theory (RBT), resource-dependence theory (RDT), transaction Cost theory (TCT), and agency cost theory (ACT).

3.1. Resource Based Theory (RBT)

Resource based theory views an organisation as a collection of resources, where a resource is termed a “fixed input which enables a firm to perform a particular task”. According to RBT organisations can gain a competitive advantage through differentiating themselves in their collection of resources (resource heterogeneity) and by the resulting inability of competing companies to obtain comparable resources from other firms (resource immobility). A resulting competitive advantage based on resources can be sustained through the specific attributes of the resources such as: value of the resource to the company, rareness/uniqueness of the resource among current and potential competitors, imperfectly immutability of the resource, and non-substitutability of the resource with another resource.

These notions seem to contradict that the products and services provided by IT outsourcing companies can be easily obtained by competitors (not rare or unique), and are also perfectly imitable (can be obtained through other

IT outsourcing companies). On the other hand, it supports the notion that organisations can gain a competitive advantage by working with IT outsourcing companies to source specific resources, such as physical capital resources (IT infrastructure), and human capital resources (access to skilled IT personnel). In turn, by undertaking outsourcing firms can maintain their distinctiveness of products, or their low cost position, through co-operating with their IT outsourcing partner.

3.2. Resource Dependence Theory (RDT)

RDT underpins the concept that organizations have to select and acquire resources from the environment to remain balanced and competitive. Pfeffer and Salancik (1978) explained, to manage an organization strategically a key task is to control the continuous flow of resources to ensure the survival of the company. This resource dependency actually emerges from the external environment's control of those resources (e.g. land, labour, products, services, capital, information and other inputs), which an organization needs to effectively function and to countervail uncertainty [13]. Pfeffer and Salancik (1979) identified three dimensions of an organizations environment, which together characterize the availability and exploitation of resources and the company's inter-organizational power for enforcing its competitive position:

- Interconnectedness - accounts for a company's links to the market and other firms, which are crucial for exerting power;
- Concentration - refers to the mass and diversity of resources in the environment; and
- Munificence - explains the plethora of resources, but the scarcity of critical resources in the environment.

Organisations, in turn, will enter into exchange relationships with others to obtain critical resources that cannot be generated internally. This may manifest itself in, for example, an outsourcing relationship to obtain necessary resources to perform specific IS functions. Yet, this exchange relationship between client and vendors will result in a level of dependence. The degree of dependency is then determined by the importance of the resource for the client, the number of potential suppliers and the switching costs to work with another supplier. To avoid that a resource dependency leads to 'a state of strategic vulnerability' careful evaluation of the sourcing option is essential [9].

3.3. Transaction Cost Theory (TCT)

TCT according to Coase (1937) and Williamson (1975) regards an organisation as dependent on striking a balance between internal economics of production with

the costs of transacting with external parties. TCT offers, in turn, a means for comparing different internal and external organisational forms for handling transactions either in the organisational hierarchy or in the market. In terms of outsourcing the focus is on whether to place services with an ASP or deliver services through in-house operations.

IT outsourcing offers a solution that can decrease the production costs (due to economies of scale on the supplier side), but potentially increases the transaction costs (e.g. for monitoring the supplier's performance). The theory thus describes the factors that influence the level of transaction costs: asset specificity, environmental uncertainty and infrequency of contracting. Analysing these factors in a specific IT outsourcing venture can create insight into the expected transaction costs. Together with the knowledge of the production costs this can lead to a decision whether IT outsourcing is financially advantageous or not.

3.4. Agency Cost Theory (ACT)

Finally, ACT according to Ross (1973), Mitnick (1975) and Jensen and Meckling (1976) focuses on the principal-agent relationship. Jensen and Meckling (1976, p. 308) define this relationship as 'a contract under which one or more persons (principal (s)) engage another person (agent) to perform some service on their behalf which involves delegating some decision making authority to the agent'. The focus in turn is on the most efficient contract arrangements between the agent and principal. The factor that determines the resulting efficiency of the arrangement is the agency costs. This in turn is the sum of the monitoring costs by the principal, bonding costs by the agent and the residual loss of the principal.

In terms of outsourcing ACT, provides an approach for evaluating the relative advantages of the different internal and external organisation arrangements for handling contracts between the potential outsourcing client and provider. The decisive factors are those that ACT describes as the factors that influence the magnitude of the agency costs: outcome uncertainty, risk aversion, programmability of provider's behaviour, outcome measurability and the length of the agency relationship. These in turn shape the outsourcing decision.

3.5. The Contingency Model

Cheon, et al (1995) integrate the four theories into a contingency model, which takes into consideration the different variables that directly influence the focus of each of the theories (see figure 1). Taking these into consideration, the framework will help to evaluate the situation under which outsourcing, i.e. the ASP option

may or may not be appropriate.

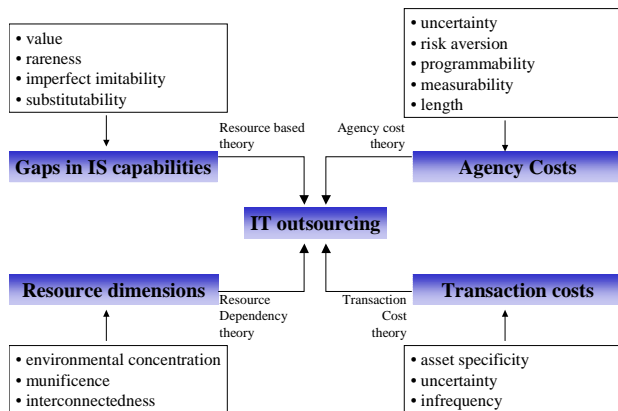


Figure 1. Contingency model [2]

The combined in the theories offer an instrument to analyse the IT outsourcing phenomenon from both an economic and a strategic perspective, which matches with the pattern identified by McLellan et al. (1995) and others that most outsourcing initiatives are driven by both economic and strategic motives. However, although the model offers more richness, it needs to be stressed that it is not expected to unravel the entire IT outsourcing complexity. More importantly, the theory has not been validated in empirical research and hence its usefulness to explore the outsourcing option is questionable to date.

3.6. ASP Research Propositions

Based on the close relationship between the decision making process of IT outsourcing and an ASP, the theoretical model is used to define a number of propositions that form the basis for this explorative research. The four theories discussed each provide a different angle.

3.6.1. RBT - Proposition 1. “Using an ASP is a strategic decision to fill gaps in IS resources and capabilities that enable an organisation to carry out a specific strategy.”

3.6.2. RDT - Proposition 2. “ASP clients become highly dependent on the ASP due to the importance of the service provided, the small number of alternative suppliers and the cost of switching suppliers.”

3.6.3. TCT - Proposition 3. “The transaction costs for working with an ASP are relatively low due to low asset specificity and low uncertainty, as a result of the commoditisation of the service provided by the ASP.”

3.6.4. ACT - Proposition 4. “Agency costs consisting of monitoring costs for the principal, bonding costs by the agent and residual loss of the principal will increase in the long run due to outcome uncertainty caused by technological change.”

3.6.5. TCT & RBT - Proposition 5. “Small and medium sized companies are especially interested in ASPs because their access to strategic resources compared to larger competitors is at a scale disadvantage, and it is to normally costly to acquire the necessary resources to be competitive.”

3.6.6. RBT & RDT Proposition 6. “The wide acceptance of ASPs is due to the weak pool of IS resources and capabilities of clients and the beneficial environmental conditions of an increased number and diversity of ASPs.”

4. Research Methodology

The research for this paper falls in the category of explorative-descriptive research [1] for which we employed case research. The cases selection was informed by three main reasons. Firstly, the exploration of the ASP market indicates a large diversity of ASP offerings and ASP players. In order to address the criteria of external validity, the cases were thus chosen to cover as broad a range of ASPs as possible. We identified this as the best starting point for identifying the differences in business models. Secondly, we were able to gain access to major participants and stakeholders over a period of six months, which combined with existing case materials allowed us to carefully study ASPs. Thirdly, the selection of the cases was informed by our interpretive stance in doing case research [16, 24]. The interpretive tradition does not reflect on how typical or representative a case may be, but rather on its potential explanatory power [22, 23]. The cases selected have paradigmatic characteristics in terms of ASP practice. Hence, case studies of these companies would be of interest and of real value for further investigation.

4.1. Data Collection

The data collection was undertaken between January 2000 and May 2000 through interviews and reviews of various secondary documentation. The documentation included numerous press releases, internal documents such as memos, company reports, presentations, sales and marketing brochures and a detailed review of the companies various web-sites. In addition, secondary literature was collected and used including numerous current and backdated newspaper articles were accessed

through various CD-ROM databases, attendance of the first European ASP summit in March 2000 in London, UK, research studies from professional market research companies such as IDC, Gartner, Forrester, ASPstreet, ASPnews, ASPIC, Durlacher, and others and various trade press articles were collected.

In preparation to conduct the interviews, two pilot interviews were held with companies that plan to enter the ASP market. Attendance of an IT-fair (CEBIT, Hannover, Germany) allowed to set up meetings with Baan and SAP to discuss the ASP market, their (future) offerings and client cases. These two try-out interviews lead to a

mental models to elicit corroborative data. These steps were essential to achieve what Yin (1989, p. 84) suggests as developing a clear “chain of evidence”, which in addition to our case study database would allow others to “follow the derivation of any evidence from initial research questions to ultimate case study conclusions.”

5. Case Studies

Due to length limitation, the following table 2 briefly outlines the case studies undertaken.

Table 2. Application Service Provider case studies

ASP	Base	Applications	Client scenarios
EC-Gate	Netherlands, Canada	Oracle application suite	EC-Bouw
Netstore	UK	Microsoft Exchange, System management	Opus
Usinternet-working	US	ERP, CRM, E-commerce, horizontal and vertical applications	USWest
Corio	US	ERP, CRM, E-commerce, horizontal and vertical applications	Excite@Home

number of research avenues and ideas to structure the interviews and the protocol. The researchers then conducted 15 interviews at various locations in Europe (i.e. UK, Netherlands, Belgium and Germany) including company headquarters, hotels and conferences. The interviewees with IT managers, CTO, Managing Directors, CEOs, Senior Outsourcing Directors, Sales and Marketing Managers, Strategic Business Development Manager, CIO, and Consultants were between 90 to 180 minutes in length. All interviews were conducted using open-ended questions informed by the literature on IT outsourcing, our knowledge of ASP and the market, the theories of the contingency model and our research propositions. The semi-structured interview protocol was designed to elicit data about ASP practice, offerings, customers, benefits and disadvantages, selection and evaluation practices. All interviewees were assured of anonymity to promote open discussions. Similar to Kirsch's (1997) approach, any one of the questions posed aimed to shed light on a number of issues and support or negate our propositions.

4.2. Data Analysis

In line with Glaser and Strauss's (1967) and Parkhe's (1993) suggestion, our analysis to elicit key data that explored the propositions and gave us a better understanding of the ASP market and practice had to go through numerous iterations of various data sources, i.e. interviews, documents, reports, and articles that we had accumulated to formulate a coherent and consistent story. With each iteration cycle - following the hermeneutic circle principle to case study development [21] - the cases took shape. In addition, we also began to move back and forth between the data and the propositions and our

6. Discussion and Analysis

The cases are used to determine the validity of the propositions, even though the four cases represent only a very small selection of ASPs. The discussion will though highlight the differences between the ASPs where it leads to a different conclusion regarding the propositions.

6.1. Proposition 1

The cases illustrate the needs of the clients and the solution the ASP is able to provide. Opus, a marketing agency that heavily relies on their messaging system, has tried unsuccessfully to manage it in-house. Constant problems and dissatisfaction showed that Opus was not able to identify the necessary IT resources and apply the right capabilities to handle email services. NetStore, in turn, was able to offer a solution in the form of a MS Exchange service that would fully manage and maintain these services by their experienced technical people. Also in the other cases the ASP provides the client with unequalled IT resources and capabilities. Corio enabled Excite@Home to sustain its rapid growth, while USi empowered the USWest sales agents by providing Siebel based relationship management services. EC-Gate developed a solution for an efficiency problem that the construction industry was not able to solve by themselves. All of these cases, yet in another way, support the proposition and emphasises the vital role that an ASP can play in filling gaps in IT resources and capabilities.

6.1. Proposition 2

The exchange relationship between ASPs and clients results in a degree of dependence that differs from case to

case and is based on the applications and services sourced from an ASP. This is clearly illustrated by the service provided by EC-Gate. The pivotal role that EC-Bouw plays as "market maker" and EC-Gate as technology platform provider, indicates the high level of dependence. The e-commerce platform, that functions as an online community or electronic marketplace, is of crucial importance for all participants in reducing the costs by removing inefficiencies in the trading process. Currently this is one of the only online community available for the construction industry, few alternative suppliers exist. Considering all the specific business rules that EC-Gate implemented into the electronic market system, a switch to another platform or supplier would cause a long lead time and high costs for re-inventing the logic that underlies this marketplace. The participants are thus highly dependent on the ASP for receiving the efficiency benefits.

Some of the other ASPs and client scenarios display a similar dependence. Excite@Home makes use of an integrated suite of applications to support several of their business processes, including financials, HRM, ERP and CRM. The essential integration of all these packages which Corio handles, increase the dependency as the skills and know-how required is immense. Switching thus becomes impossible in most cases. NetStore also supports the proposition, considering the few alternative suppliers that provide an MS Exchange based messaging solution.

However, dependency cannot be identified in the case of USi. The Siebel based relationship management functionality is also included in other application packages. The service provided by USi is thus valuable, but can easily be replaced by another application. The same or alternative applications that USWest sources from USi is offered by other suppliers as well. In addition, since limited integration efforts have occurred, switching costs are relatively low. Therefore, there is low degree of dependency.

6.3. Proposition 3

The ASP model is characterized by offering commodity services to many clients simultaneously. A commodity service implies a more standard offering that is used by many clients. The commoditisation of the service provided by the ASP can lead to low asset specificity, low uncertainty and higher frequency of the transaction.

The commoditisation of the ASP offering is not applicable to all cases. The services provided by NetStore and EC-Gate can be described as a commodity, but this does not apply to the case of Corio, nor can support be found in the case of USi. The asset specificity for the clients of NetStore and EC-Gate is low due to the absence of additional transaction specific investments. In both

cases clients are not required to purchase, for example, hardware to run the applications on, nor is there a need to invest in application licenses or specialized IT personnel. The services can be regarded as rather standardized since many clients are making use of the same applications. The uncertainty is decreased as a result of knowing in advance what product and service is obtained from the ASP and the measurability of the availability and performance of that service. These characteristics of the applications and services offered by NetStore and EC-Gate therefore result in a relatively low transaction costs.

These characteristics cannot be identified due to a lack of information in the case of USi. Corio on the other hand represents an ASP service that cannot be considered a commodity. In the client scenario of Excite@Home another application was set aside, for which previously high investments were made. This can be regarded as a high asset specificity to initiate the transaction between Corio and Excite@Home. Uncertainty was also low due to the high degree of integration for the applications sourced by Excite@Home. Therefore, the results and fit with the business needs cannot be predicted or specified in detail in advance, resulting in a high level of uncertainty. The service provided by Corio in this case can thus not be considered a commodity and the proposition is therefore negated.

6.4. Proposition 4

This proposition addresses the uncertainty of the value of the ASP offering for clients in the long run, which arises as a result of the technological change. The novelty of the ASP firms and the early stage of the client relationships makes it difficult to analyse this proposition.

The agency costs are determined by the costs that arise from monitoring whether the ASP delivers on its promise, and achieves satisfaction levels. The outcome uncertainty refers to the possibility that the ASP will not deliver the promised services, as defined in the SLA. These monitoring costs are further affected by technological change in two ways. Firstly, it is uncertain if an ASP will integrate technological advances in its offering and make such benefits available to its clients. Secondly, in the case that an ASP includes technological advances, it is uncertain what implications it has on the service level and pricing.

The bonding costs are also influenced by the technological change. Technological advances in which clients are interested require an ASP to consider these in its offering to ensure satisfaction levels. These technological changes can, however, affect the available applications and the technical infrastructure that undergird clients services. The ASP is thus pushed to make additional investments to bond the client and maintain satisfaction.

Technological change also affects the prices of hardware and software continuously. For example, the price/performance ratio for processors and disk capacity is falling steadily. It is uncertain though whether an ASP solution reflects these market changes sufficiently. What is needed an ongoing market comparison ensuring reduction in asset prices that customers can benefit from.

For EC-Gate, USi and Corio the monitoring costs, bonding costs and margins are subject to change due to technological change. These cases demonstrate the change in application functionality provided and the effects it has on the service levels and pricing. EC-Gate requires re-negotiation of the contract for new functionality that has become available, which can lead to higher pricing. The clients of USi and Corio both have evolved from using a single type of application to a combination of different applications. It is uncertain how these ASPs respond to new versions of these applications with improved functionality.

The cases do provide some support for the proposition, but the novelty of the ASP-client relationship limits the possibility to deduce conclusive statements.

6.5. Proposition 5

The proposition states that ASPs provide necessary IT resources for SME's to remain competitive without incurring significant cost increases. The client scenarios of NetStore and EC-Gate seem most representative of SME's making use of an ASP and both offer support for the proposition.

The participants of the electronic marketplace created by EC-Gate benefited from this ASP solution. The resources required to build such a system are not likely to be available to a single player. Yet they are necessary to deal with the potential inefficiency. EC-Gate addresses this specific need by bringing the market players together and improving trading efficiency. In turn, participants can share the costs for the development and operation of such a system by working with an ASP.

NetStore on the other hand, is able to operate its messaging service at a lower cost and higher quality than its customer Opus was able to do previously. This type of resource is of strategic importance to Opus. Considering the other clients that NetStore has, e.g. Cisco, a similar service is provided to a subsidiary of a large company that otherwise would also encounter potential difficulties in obtaining access to essential IT resources. There is, however, indication that not the size of a company, but the scale of operations will determine an ASPs level of interest.

6.6. Proposition 6

This proposition describes the relation that exists between the rapid growth of ASPs and the current scarcity of skilled IT personnel. In the case of Opus the difficulty of finding specialized IT personnel for maintaining their messaging system was noted as one of the primary reasons to work with NetStore.

For the other cases it is not clear whether the scarcity in IT personnel indeed formed the primary driver behind the choice for an ASP. In addition, the question can be raised whether ASPs themselves will succeed in attracting and then retain sufficient IT personnel in the current market shortage. The increased number and diversity of ASPs that are currently active in the market do expand the options companies can choose from, but their sustainability and future is still highly uncertain.

Overall the cases did not provide sufficient support for this proposition. Further research is required to gain insight into the reasoning behind clients ASP decisions.

7. Conclusions

ASPs provide an option for companies to securely source applications and services via the Internet. It fills the market gap that exists between available and required IT resources and capabilities to address a specific problem or execute a strategy. However, the ASP option will enter customers into a dependency relationship, which is only minimized by the degree of application and service request standardisation.

This paper shows that the level of application commoditisation and services sourced from an ASP determines the transaction costs. Transaction costs can be reduced in the case of sourcing standardized applications and services, but will increase with degree of application customization. Reason for this is clearly the level of value-add an ASP provides, which makes a solution more specific.

The uncertainty of an ASP option arises with the length of its running and how an ASP responds to technological change. This also applies to changes in business needs for which an ASP possibly cannot provide an appropriate solution.

The solutions provided by ASPs are of particular interest to small and medium sized companies and divisions of larger corporations due to the scale advantages and specialized technical solutions that can be generated. It cannot be determined yet whether ASPs offer a solution for the current scarcity of skilled IT personnel. Although rapid growth is predicted for the ASP market, ASPs still have to prove whether they can successfully concentrate and retain skilled IT personnel. Of chief concern in the moment must be experience and lessons learnt of mitigating the risks inherent to the ASP model. Table 3 outlines the advantages and

disadvantages of the ASP model our research found.

Wiedefeld and Nicholson.

Table 3. Advantages and disadvantages of working with an ASP

Type	Benefits	Potential Risks
Business	Fills gaps in IT resources and capabilities to address problem or execute strategy	High level of dependence on the ASP for customised solutions
	Low level of dependence for commodity applications offered by alternative suppliers as well	Uncertain if and how ASP responds to technological change
	Enables SME's and divisions of larger corporations to gain access to specialised technical solutions	No certainty whether ASP can cater for changing business needs
		Uncertain if ASP can attract and retain sufficient IT personnel
Economic	Low transaction costs for commodity applications	Customised solutions increase the transaction costs
	Lower costs as result of scale advantages for SME's and divisions of larger corporations	Price can increase as consequence of ASP's response to technological change

7.1. Role and limitations of Model & Research

The contingency model proved to be useful in combining a strategic and economic perspective for evaluating the ASP option. The underlying theories offered room to derive propositions that enabled a focused research study. One of the major limitations is the lack of technical perspective.

Additionally, the framework does not provide guidelines how the different perspectives are combined or weighed to develop a well-funded decision or evaluation of the IT outsourcing option.

The model thus cannot be considered appropriate to guide further research into ASPs, although it has been useful as a starting point for this explorative paper.

Furthermore, the sample used to investigate the ASP option was limited, especially in respect to customers ASP decision criteria and selection reasons. We thus recommended and emphasise the need for further in-depth studies of several ASP-client relationships to identify the true value of the ASP solution to small, medium-sized and large companies.

8. References

[1] Engeldorp Gastelaars, Ph. van and E. de Leede (1996). *Over het doen van bedrijfskundig onderzoek*, Nieuwekerk a/d IJssel, Netherlands, Adres Servicepost B.V.
 [2] Cheon, M.J., V. Grover and T.C. Teng (1995). "Theoretical perspectives on the outsourcing of information systems." *Journal of Information Technology* 10(4): 209-219.
 [3] Coase, R. H. (1937). "The Nature of the Firm." *Economica* 6(16): 331-351.
 [4] Cole, S.J. (1999), "The Apps Market: 1998-2003", *Forrester Report*, Forrester Research, April 1999
 [5] Gartner Group (2000), "ASP Market: Controlled Chaos or Fragmented Free-for-All?", *Gartner Group Research Note*, Gartner Group, 2-02-2000
 [6] Glaser, B. and A. Strauss (1967). *The Discovery of Grounded Theory: Strategies of qualitative research*. London,

[7] IDC (1999). "Worldwide Application Service Provider Forecast, 1998-2003.", IDC, announced through IDC (<http://www.idc.com/Data/Internet/content/NET032699PR.htm>), (26-03-1999)
 [8] Jensen, M. C. and W. H. Meckling (1976) "Theory of the Firm: managerial behavior, agency costs and ownership structure", *Journal of Financial Economics*, 3, 305 – 360.
 [9] Kern, T. (1999) "Relationships in Information Technology Outsourcing: An Exploratory Research Study of a Conceptual Framework" Unpublished DPhil Thesis, University of Oxford: 468.
 [10] Kern, T. and L.P. Willcocks (2000) "The Relationship Advantage: Information Technologies, Management and Sourcing", Oxford University Press
 [11] Kirsch, L. J. (1997). "Portfolios of Control Modes and IS Project Management." *Information Systems Research* 8(3): 215-239.
 [12] Klein, H. K. and M. D. Myers (1999). "A Set of Principles for Conducting and Evaluating Interpretive Field Studies in Information Systems." *MIS Quarterly* 23(1): 67-94.
 [13] Kotter, J. P. (1979). "Managing External Dependence." *Academy of Management Review* 4(1): 87-92.
 [14] Lacity, M. C. and L. P. Willcocks (1995). "Interpreting Information Technology Outsourcing Decision from a Transaction Cost Perspective: Findings and Critique." *Accounting, Management & Information Technology* 5(3): 203-244.
 [15] Lacity, M. C. and L. P. Willcocks (1998). "An Empirical Investigation of Information Technology Sourcing Practices: Lessons from Experience." *MIS Quarterly* 22(3): 363-408.
 [16] Lee, A.S. (1991). *Integrating Positivist and Interpretive Approaches to Organizational Research*. Organization Science, 2(4), pp. 342-366
 [17] Mateyaschuk, J. (1999), "Leave the Apps to us! ASPs offer benefits through economies of scale.", *Information Week* (<http://www.informationweek.com/756/asp.htm>), (11-11-1999)
 [18] McLellan, K., B.L. Marcolin and P.W. Beamish (1995). "Financial and strategic motivations behind IS outsourcing." *Journal of Information Technology* 10(4): 299-321.
 [19] Mitnick, B. (1975) "The Theory of Agency: the policing 'paradox' and regulatory behavior" *Public Choice*, 24, 27 – 42.
 [20] Pfeffer, J. and G. R. Salancik (1978). *The External Control of Organisations: A Resource Dependence Perspective*. New York, Harper & Row.

- [21] Ross, S. (1973) "Economic Theory of Agency: the principal problem" *American Economic Review*, 63, 134 – 139.
- [22] Smith, N. C. (1990). "The case study: a useful research method for information management." *Journal of Information Technology* 5(3): 123-133.
- [23] Stake, R. E. (1994). "Case studies". in *Handbook of Qualitative Research*. N. K. Denzin and Y. S. Lincoln (Eds). Thousand Oaks, CA., Sage Publications: 236-247.
- [24] Walsham, G. (1995). "The Emergence of Interpretivism in IS Research." *Information Systems Research* 6(4): 376-394.
- [25] Willcocks, L.P., M. C. Lacity and T.Kern (2000) "Risk Mitigation in IT Outsourcing Strategy Revisited: Longitudinal Case Research at LISA" *Journal of Strategic Information Systems* Vol. 12
- [26] Williamson, O. E. (1975). *Markets and Hierarchies: Analysis and Antitrust Implications, A Study in the Economics of Internal Organization*. New York, The Free Press.
- [27] Yin, R.K. (1989) *Case Study Research: Design and Methods*, 2nd Edition, Sage, Newbury Park, California.