December 2003

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Recommended Citation

Desai, Bhavini and Currie, Wendy, "The Application Service Providers Business Model: Issues and Challenges" (2003). *AMCIS 2003 Proceedings*. 18.
http://aisel.aisnet.org/amcis2003/18

THE APPLICATION SERVICE PROVIDERS BUSINESS MODEL: ISSUES AND CHALLENGES

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Abstract

In the last few years there has been much interest in the delivery of software-as-a-service. The concept of remote delivery of software by Application Service Providers (ASPs) has captured the imagination of many academics, practitioners and technology analysts. Yet analyst predictions and expectations with respect to the growth of this new e-business model have not been realised. Although many Independent Software Vendors (ISVs) and other firms such as Telcos' have embraced the ASP business model, few have managed to deploy this business model profitably. Many firms that entered the market in the dot.com wave have struggled to stay in business due to the highly dynamic and turbulent nature of the ASP market. After all these years of struggle, the ASP business model has still failed to prove itself and achieve what it was out to achieve. This paper provides the results form the first two phases of an ongoing research and helps in understanding the factors that inhibited the take up of the model.

Keywords: Application service providers, failure, ASP business model, business model evolution

Introduction

Despite the promise and potential of improving the way organisations develop, operate and maintain information technology applications, Application Service Providers (ASPs) have fared poorly in terms of attracting a large client base, as examined by Anjana et. al (2003) . In the last few years there has been a lot of paranoia about the phenomenon of Application service provision. Application Service Providers are third party services that maintain and distribute software-based on selective outsourcing solutions to demanding customers. The application service provider (ASP) business model had proposed to procure and implement complex systems managed via a central location. *Currie, (2000), further explains that*, providers could thus diversify their client database and customers could efficiently control their information technology needs by beneficiating from secure hosting of their business data and scheduled costs. When the ASP phenomenon was introduced in the market, groups like IDC and Forrester forecasted that they would be worth $7 billion in 2003. However, in a study carried out, *Clancy, (2001)* claims that, in spite of hype surrounding introduction of the ASP business model amid claims that the solution was aimed at Thus small and medium enterprise (SME) market, adoption of the model has been slower than expected

Literature fails to provide an accurate picture of current state of the ASP market and any strong evidence highlighting the reasons why it failed. Literature also fails to provide figures of ASPs that initially jumped on the bandwagon and in present day, how many of those have survived, the applications they provided, and customer sectors they targeted. This paper uses results from the first two phases of an ongoing research focused on studying different phases of the ASP business model and an investigation into the reasons for their failure to fulfil market expectations thus answering all the above queries.

This paper is organised as follows: The second section provides an overview of the ASP business model. For this paper, business model has been used as a unit of analysis as it depicts the design of transaction content, structure, and governance so as to create value through exploitation of business opportunities as proposed by Amit and Zott (2001). The third section is about research methods. This section explains the two phases of research. Fourth section discusses data collection and analysis followed by a fifth section on theoretical understanding of issues that failed ASPs. In the sixth section, the authors identify future directions for research.

Literature

According to a definition provided by Donahue (1999), an ASP renders software as a service, providing applications and IT infrastructure and support services to customers on a subscription basis, and bears responsibility for efficient provision of these services. An ASP combines several software capabilities and roles such as development, management, and support, highlighting the need to study the multifaceted nature of ASP usage. A corporate IT user accessing an IT application hosted by ASPs is therefore in a "service encounter" as proposed by Bitner et al. (1990), which is further explained by Shostack (1985) as a period of time during which a consumer directly interacts with a service, in this case, with an ASP. The ASP Industry Consortium (1999), defines ASP as a component that manages and delivers application capabilities to multiple entities from a data centre across a wide area network. The model offers the SMEs, a possibility of leveraging costs as a result of the economies of scales characterising it. Based on the principle of one-to-many, the ASP model was believed to create enormous cost savings of the order of 20 to 50 percent as claimed by Miley, (2000). Columbus, (2000) further adds, that by taking away day to day hardware and systems management duties, the ASP model promised to give firms, an opportunity to focus on their core functions.

Currie (2000) identified different types of ASP models that had emerged in the market at the time of its boom as can be seen from Table 1.

Table 1. Types of ASPs

No.	Name(Type)	Main Features
1.	Pure Play	This type of ASP licenses software from a variety of vendors
2.	ASP enablers	Use the best-of-breed service providers
3.	Partnerships	Access a large community of prospective clients that share the same interest.
4.	Enterprise	They target medium sized companies either through their own channels or through another ASP
5.	Horizontal	These type of ASPs are aimed at all markets and offer collaboration tools like groupware

However, Heart and Pliskin (2000) identify two main business models out of others that are very prominent in industry. They are horizontal and vertical. They define horizontal ASPs as ones that cater for a wider variety of organisations and verticals as ones who cater for an industry, such as hospitality, health, finance etc offering applications tailored to the specific needs of the industry.

Dean (2000) highlights that, despite hype surrounding the introduction of the ASP concept and the claim that the solution was aimed at the SME market, it has failed to fulfil predictions for success in terms of market growth. As mentioned earlier, most of the existing literature suggests that the model has fared poorly, but fails to focus on how poorly and why. Work of authors like Clancy (2001), Desai *et al*. (2002), David Lipschultz, (2001), Caulfield (2000), etc. helps in identifying some problems with the take up of the model and thus proving reports of research groups such as IDC and Gartner's (2001) wrong. Throughout the year 2000, numerous such firms entered the market as self-styled ASPs promising to offer industry focused (vertical) or business focused (horizontal) software applications to customers, Currie et al. (2003). A competitive analysis using Porters model (1985) of the ASP market shows low barriers to entry as one of the major weaknesses of the model. However, to-date, vested interests within IT departments, problems of customer positioning within the market and fears about data security and infringement have prevented many companies from fully investigating and integrating the model, says Currie *et al*. (2003). Moreover Ferenful (2002) further claims that several customers of ASPs were unsatisfied with their service, which questions the viability of the model. Heskett et al. (1990) says it has been long recognised that market success depends on designing services to match customer needs and this is further supported by Anderson and Sullivan (1993) who believe that customer satisfaction has a positive impact on market share and profitability. Satisfied customers are more likely to engage in positive word of mouth as claimed by Anderson et al. (1994), Fornell (1992). Keller (1993) takes this argument further by saying that satisfaction plays an important role in building other important assets for the firm such as brand equity and this then leads to long-term continuation of relationships as referred by Anderson and Narus (1990). Though there is ample much literature on failure of model, it lacks to provide any strong evidence on issues responsible for its failure.

Heart and Pliskin(2001) have studied inhibitors and drivers of the ASP business model and have placed them into three categories. These three categories namely technological, managerial and behavioural have served as both, drivers and inhibitors of the model. They conclude that, technological factors like scalability; managerial aspects of speed and focus and behavioural aspects of price and flexibility have acted as promoters of the model. However, there are also some factors that have inhibited take up of the model. Technical issues like connectivity and internet, managerial issues such as trust in the model, and reluctance to be locked in long-term contracts and operational issues of customisation, range of applications offered and integration of applications offered have been some of the issues that have hindered in the models acceptance. The research however, fails to provide any empirical evidence to back the results.

The ASP concept is viewed as a subset of E-Commerce as quoted by Heart & Pliskin, (2001). Two major types of players that have been dominant in E-commerce are "horizontal" and "vertical" market enablers, creating web sites where buyers and sellers come together to communicate, share ideas, advertise, bid in auctions, conduct transactions and coordinate inventory and fulfilments Goldman-Sachs (1999, page 16). E-Commerce history reveals that horizontal ones suffer from slow penetration rates and low number of transactions between members. These markets also face competition imposed by larger enterprises, themselves creating electronic markets, which are more attractive to their suppliers, customers, and business partners. Dror (2001) identified that vertical markets fare better and that 75% of electronic markets in 2002 would be "niche" ones. However results from first phase of research contradict with literature. Research reveals that out of 424 companies investigated, approximately 88% were horizontals and only 12% were vertical. First phase of research also reveals an average of types of applications provided and a percentage of different customer verticals targeted by ASP. Further, it also becomes evident that, one of the major reasons for failure of the model was its failure to acquire customers' trust resulting in a very poor client base. This research also provides empirical evidence on reasons that led to customers' hesitance in accepting the model hence resulting in its failure.

Research Study

Current literature reveals the models failure in fulfilling prior predictions about its success. However, in addressing this question, academic literature dealing with ASPs is still scarce as noted by Heart and Pliskin (2001). Further more, literature lacks any theoretical explanation for the failure. Main objective of this research is to provide theoretical backing for the justification of research and literature. The research is being conducted as a part of requirement fulfilment of EPSRC and ESRC projects.[1] The research aims to utilise theoretical understanding of issues related with the model to sculpt a framework that can be used by trends like Web-services or any other e-business models that are to follow the ASPs. These new trends will be able to identify errors made by ASP's in past and learn lessons and prevent following the path of the ASPs.

In late 1990's, many small companies emerged wanting to be called as ASPs and all they did was, provided very basic applications or services over the web. This was the result of a very strong venture capital funding. Some of the larger companies jumped into the bandwagon and started to provide some infrastructure applications and few other applications. However, the year 2002 saw the whole scenario change. Money dried up and the model, which was expected to provide large profits and revenues, seemed to fail. This research tends to provide an overview of companies that entered the bandwagon and the models current status. Research proceeds in different phases. As explained earlier, first phase of research is about an investigation of literature for studying the current state of the ASP market. This has then been re-examined with a desk based research approach. This approach provides a clearer picture for justification of literature. For this, 424 companies were investigated from a database of 750 companies over a period of 9 months. The database is the result of a 4-year long intensive research in the ASP area. This database contained names, addresses, industry sector (vertical, horizontal etc.), product and service offerings, customers, customer verticals and partners of ASPs with type of partnerships. Customers served by different ASPs belonged to different vertical sectors like healthcare, education, financials etc. Types of partnerships involving ASPs were technological, strategic, business or alliance partnerships or channel partnerships.

Next phase of research involved conducting questionnaire surveys with ASP customers for an investigation of their requirements and expectations from the model. Analysis of research results so far, presents a list of potential issues that have been identified by customers and due to these potential risks; customers hesitance against the models acceptance. Results from the data gathered are then related to Earl's (1996) work, providing a theoretical understanding for the models failure. Earl has highlighted potential risks involved with outsourcing model. ASP business model, though revolutionary in its own ways, is said to have evolved from outsourcing, Tebboune (2002) and hence, potential risks of ASPs have been compared with the Earls outsourcing risks.

Preliminary Analysis

Phase 1: Desk-Based Research – Results

First phase of research provided an overview of emerging ASP market. First phase of research was to examine different literature on the ASP Business model. This then provided an obscure picture about current status of the ASP market. Literature portrays that, the ASP business model has failed to accomplish what it was out to achieve. Literature was than verified by a desk based

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research approach. In total 424 companies from the ASP company consortium database had been investigated to study total surviving and failed companies in the past 4 years as showed in Figure 1.

Out of surviving companies, a further breakdown of horizontal and vertical companies is provided in Figure 1. Initial examination of the sample revealed that 175 ASPs were horizontal and 24 were vertical. This is in clear contradiction with the literature, which indicates that in an E-Commerce Business Model; there will always be more number of Verticals than horizontals companies who provide very basic applications across all sectors.
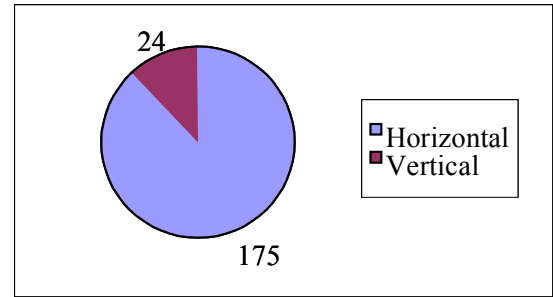
The results from the study further reveal that out of the 424 companies reviewed, 197 have failed, 40 have been acquired and 8 have merged. Only 179 companies out of 424 are surviving. This provides a clear picture of the current state of the ASP market as shown in Figure 2.

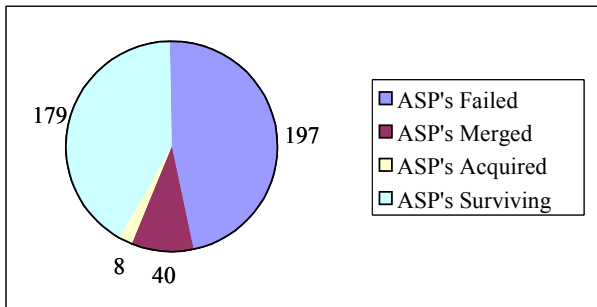ASP offerings are further shown in Figure 3.

Figure 1. Proportion of Surviving Horizontal and Vertical Companies from a Sample of 424

Figure 2. Investigation of the ASP Market

Application	99
Service	134
Desk top	24
Data Centre	32
Infrastructure	29
Network	29

Figure 3. ASP Offerings in Different Vertical Sectors

The research further depicts the number of companies in each customer sectors, Figure 4.

From the database it has also been evident that the most important customer verticals targeted by the ASP's are Banking and Finance, IT and Internet, Retail and wholesale, Manufacturing and Utilities as shown in Figure 5.

Phase 2 – Questionnaire Surveys

Next phase of research investigates the reason for ASP's ordeal. Literature provides very less information about reasons responsible for the models failure. Following an initial literature study, a questionnaire survey was designed to capture performance measures used to evaluate benefits and risks related to the model. It was recognized that many respondents in the SME sector might not use the ASP model, though they may be considering it as part of their IT outsourcing strategy. Questionnaire survey was therefore intended to elicit data and information on user perceptions of the ASP model, whether they had actually deployed ASP as a solution, or not. Respondents were asked to evaluate, on a scale of 1-4, how important they perceived specific performance indicators. Initially, questionnaire surveys were sent to 50 respondents, though this was deemed inappropriate given that IT Directors, CIOs and others with IT responsibilities are reluctant to fill in and return questionnaires. A more appropriate method of data collection was to attend conferences and trade fairs where IT professionals were interviewed, face-to-face, on their perceptions of the list of performance indicators. This method of data collection increased the validity and reliability of the data as respondents could clarify the meaning of specific questionnaires, Yin (1994). 150 responses were obtained from various visits to UK venues over a six-month period. All respondents gave their job title, company address and other details about product/service offerings and size of company. Firms were targeted in the SME sector, up to 500 employees, from a range of sectors, including, retailing, education, financial services, technology and communications and travel. More responses were received from the financial services, technology and communications sectors.

Vertical Sector	ASP's Customer's VS
Accountancy	7
Agriculture, Fishing, Forestry	6
Banking, Insurance, Finance	178
Catering & Hospitality	26
Customer services, Call centres	1
Education	83
Electronics	12
Engineering, Manufacturing, Utilities	155
Health, Nursing, Social services	134
IT & Internet	228
Legal	0
Management Consultancy	14
Marketing, Advertising, PR	25
Not for profit, Charities	4
Public sector & Services	114
Recruitment Sales	1
Retail, Wholesale	193
Science	16
Telecommunications	137
Transport, Logistics, Aerospace	14
Travel, Leisure, Tourism	43

Figure 4. Number of Customer Companies in Different Vvertical Sectors Targeted by ASPs

Banking, Insurance, Finance	157
Manufacturing	118
Health, Social Service	111
IT & Internet	161
Retail, Wholesale	178
Telecommunications	122

Figure 5. Most Targeted Customer Vertical Sectors

The authors focused the survey results on identifying key issues of remote application outsourcing under the categories of delivery and enablement, management and operations, business transformation, and client/vendor relationships. Survey aimed to identify level of importance of each of these key areas to its audience (SMEs), and responses were based on Likert scales varying from (1) – not important – to (4) – highly important.

Modified from the ASP Industry Consortium's list of performance indicators, the survey identified five categories of performance measurement: delivery and enablement; management and operations; integration; business transformation and client/vendor relationships. Four categories are discussed in this paper. Detailed explanation of each of the key factors has been presented in Appendix I. The category of integration was not a sufficient issue for SMEs, and is not one that is particularly relevant to Earl's (1996) study.

Management and Operations

Business Transformation

Client/Vendor Relationship

Delivery and Enablement

Figure 6.   Survey Results for each Key Performance Indicators

Table 1. Comparison of Risks of the Outsourcing and ASPs

Questionnaire	Earls Risks
24x7 applications availability	Outdated technology skills
Data security and integrity	Technological indivisibility
Disaster recovery and backup	Technological indivisibility
Concentrate on core activities	Fuzzy focus
Reduce total cost of ownership	Underestimating the hidden costs
Eliminate IT management problems	Possibility of weak management
Achieve greater visibility of IT costs	Hidden costs
Keep pace with latest ICT	Market being frozen in old technology
Gain senior management support for IT	Weak management
Good SLA	Endemic uncertainty, hidden costs
Financial stability of vendor	
Responsiveness to ICT change	Outdated technology skills
M&As between vendors	Management issues
Market turbulence	Easy entry to market

Theoretical Understanding of Issues That Affected the ASP Business Model

Survey results concerning the four categories discussed above are summarised in Figure 6. These results represent average response from targeted SMEs. These results interpret views of SME executives concerning significance of each criterion under each corresponding category. Whereas the above results do not determine precisely, the potential risks emerging from ASP adoption, they give an idea about the most critical aspects according to the views of some SME executives. This could,

accordingly, be translated into criterion that have to be satisfied by the ASP model, and thus could be seen as representing the potential risks proprietary to this model. However, due to immaturity of this model, proving this idea is still difficult. Consequently, having a definite idea about potential risks cannot be set until more SMEs have enough experience with the model adoption.

As the results have been compiled from two different sources, (IS/IT Outsourcing literature and ASP survey), a correlation of these results seems logical. In the following, we consider the survey's results shown in figure 6, explaining them on the basis of Earl's (1996) work (see Table 1).

Comparison of results from the questionnaire survey and risks identified by Earl, have been explained in detail in table 2.

Future Research

Areas of concern related to the take up of ASP business model have been justified with the help of structured and unstructured questionnaires. A hypothesis has been formulated on the basis of some literature and results from 1st and 2nd phases of an ongoing research, depicting a mismatch between customer requirements and vendor offerings.

Case studies can help validate this hypothesis by using a Resource Based View to identify the physical, organisational and human resources of particular firms. Vendor resource capabilities can then be identified, in-turn providing a better understanding of vendor offerings. Work of authors like Birger Wernerfelt (1984), J Barney, Andy Lockett, Steve Thompson, Michael Porter (1980), etc will be considered to formulate a theoretical understanding of the Resource based theory.

The hypothesis that has been constructed from the results of the first two phases is that vendors failure to meet customers needs, has resulted in unsatisfied customers and an ASP business model that continues to be challenged and case studies may help validate the hypothesis.

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Appendix I

Under the key area of *delivery and enablement*, the survey focused on finding how significant SMEs perceived 'data security' and 'disaster recovery' to be. These issues were considered due to the insecure nature of the Internet particularly for a task such as software application delivery. Since the data is held usually in a remote data centre in an ASP outsourcing model, security issues such as access authentication, application security, data encryption, intrusion detection, real-time assessment, anti-virus and physical security are vital to the outsourcer. As shown in Figure 1, SMEs who responded to our survey indicated that the issue of data security would be highly important for them if they outsource applications to an ASP.

The second key area in the questionnaire, *management and operations*, covers issues such as the significance of reducing costs by using the services of an ASP and the focus on core competencies to gain competitive advantage. Issues such as total cost of ownership (TCO) of technology were considered as relevant by the vendors selling ASP solutions. They reasoned that SMEs would adopt the ASP solution to reduce their IT costs; though many did not equate the size of the firm with the size of the IT budget. For example, one Telecommunication firm, selling an ASP solution, found that few SMEs spent more than £1million per annum (inclusive) on their IT.

Under the third key area, *business transformation*, the survey aims to identify the significance of IT and the services provided by the ASP in the context of business improvement.   The passing of responsibility for core applications to an ASP vendor can be for any SME, something to approach with caution. The fear of loss of control within the organisation is a valid concern for many companies. For an organisation with a significant internal IT department, use of an ASP is likely to be seen as a significant threat to the 'power' of the IT/IS department, and thus use of an ASP is likely to be seen as a significant threat to the 'power' of the IT/IS department and to future employment prospects (Ovum 2000).

Finally, the fourth key area in the survey questionnaire covers the important topic of *client/vendor relationship*. Under this area, the importance of vendors' status to the customers, their financial stability, mergers and acquisitions between vendors, market turbulence and uncertainty, and vendor's responsiveness to ICT changes are considered.