

APPLICATION SERVICE PROVISIONING AS A STRATEGIC NETWORK

Evaluation of a Failed ASP Project

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Abstract: In this paper, we analyse Application Service Provisioning (ASP) by means of a framework derived from the strategic network approach presented in the management strategy literature. Our ex-post analysis focuses on a failed ASP project, in which a small software company and a large telecommunications operator formed an alliance in order to launch an innovative ASP software offering in the market. The objective of the paper is to operationalize the new strategic network oriented concepts in order to better understand and manage problems in developing integrated ASP offerings.

Our results from both conceptual and empirical work indicate that several important new issues can be raised if the ASP integration is examined as a strategic network (a kind of software ecosystem). We propose a framework that identifies these factors and test its power to predict success or failure in our case. On the basis of our analyses, we propose practical guidelines to be followed when moving from the management of products and services to the management of an ASP partnership network.

Key words: Application Service Provisioning, Strategic Networks; Evaluation.

1. INTRODUCTION

In the late 1990s, many industry analysts forecasted explosive growth for the Application Service Provider (ASP) market. So far the ASP market has not lived up to these expectations. A recent study on ASPs (Desai and Currie, 2003, pp.177) showed that out of the 424 companies reviewed, 203 have

failed, 40 have been acquired and 8 have merged. Only 173 companies out of 424 are surviving. However, there are also ASPs that are doing profitable business. It has been suggested that the ASP industry is following the chasm model (Moore, 1991) and that it is still in the middle of the dividing chasm between the early adopter group and the majority market (Aberdeen Group, 2001).

ITAA and ASPIC have jointly defined ASP as “any company that delivers and manages applications and computer services to subscribers/clients remotely via the Internet or a private network.” (ITAA press release, 2001). Some authors argue that the ASP model can be seen as an extension to IT outsourcing (Currie, 2000; Currie & Seltsikas, 2000; Heart & Pliskin, 2001, pp.34). The ASP model has also been compared to the service bureau model that was common in the 1960s and 1970s (Walsh, 2003, pp.103; Kakabadse & Kakabadse, 2002, pp.206; Toigo, 2002, pp.101). Timesharing bears similarity to the ASP model in that applications are hosted centrally at the service provider’s site and rented out to a multitude of users. In addition to technological advances, the difference between the ASP model and time-sharing is that ASPs offer a one-to-many business model. Technology plays a significant role as an enabler in the ASP model, as the ASP technology platform (infrastructure) is built to sustain a large number of clients, with “any time” access, using high processing power and bandwidth (Kakabadse & Kakabadse, 2002, pp.206).

An application service is an integrated bundle of elements from different domains such as network connectivity, technology platform (hardware, operating system, middleware, etc.), operations (hosting and facilities management), end services (implementation, deployment, customization, integration) and applications. (Apfel, 2000; Legg Mason Wood Walker, 1999; Klemenhagen, 1999; Giotto Perspectives, 1999). Each of these elements requires different sets of skills that are seldom mastered by a single company. Typically the application service provider has to partner with other firms to leverage expertise in all required skill domains (Sharma & Gupta, 2002, pp.164). This tendency is also illustrated by Currie and Seltsikas’ ASP ecosystem model (2000, pp.5) that depicts typical partnering arrangements and various stakeholders that comprise the ASP offering. A similar idea is presented in Messerschmitt and Szyperski’s (2000, pp. 23) value chain model for the software industry as well as in the ASP value chain model presented by Hoch et al. (2000, pp.6). In the “Software as a Service” strategic backgrounder of Software & Information Industry Association (Hoch et al, 2001), the ASP value chain is proposed to consist of five different expertise areas to be integrated by the provider of the customer service. These are *hardware and operations services, infrastructure software development and integration, network service providing, innovative application development*

and *customer service provisioning*. It is evident that successful management and integration of this variety of competencies will need more complex collaboration among firms than before.

Desai and Currie (2003, pp.179) have indicated the need for research on ASP business models. They suggest that the existing research should be extended by doing case studies on ASPs to investigate how the different vendors have structured their business models and why some vendors failed while others succeeded. A relevant basis for sophisticated analyses of ASP business models could be a general model of e-commerce (e.g. Amit and Zott, 2001). Another and a more focused way could be to evaluate ASP cases using strategic network models proposed in the management strategy literature.

1.1 Objective and outline of the paper

In this paper, our aim is to operationalize the concepts and ideas presented by Gulati et al. (2000) in their strategic network model in order to better understand the complex ASP value chain or ASP business ecosystem. Based on this model, we identify a set of key factors that will be used as a tool of inquiry in the case study, covering not only the single companies involved but also important network issues proposed. Our research questions are:

1. What are the new key factors (issues) affecting the ASP-partnership when a strategic network model is applied instead of an single company view? Will these factors help us to better understand the reasons for ASP failures in real life?
2. Which principles can be derived from the network approach for the better management of new ASP offerings?

In the first section above, we have discussed the ASP model as it is presented in the existing literature. In the next section, we will review the strategic network model (Gulati et al, 2000) and generate a research framework for analyzing our case. In the following Section 3, we shortly discuss the methodology used in the case study. Section 4 presents the case study, an innovative collaborative development project between a small software company and a large operator. In Section 5, we analyze the case using the research framework proposed, and finally in Section 6 we discuss our findings and present our conclusions.

2. DEVELOPING A FRAMEWORK FOR ASP EVALUATION

2.1 The Strategic Network Approach

Traditionally, firms have often been seen in the literature as atomistic actors competing for profits against each other in an impersonal marketplace. In this article, we will use the term *atomistic view* to refer to this traditional point of view. Gulati et al. (2000) argue that the conduct and performance of firms can be more fully understood by examining the *network of relationships* in which firms are embedded. Their strategic network model challenges the atomistic view by suggesting that firms are more properly viewed as connected to each other in multiple networks of resources and other flows. These linkages bind them in complex relationships that are simultaneously competitive and cooperative.

2.2 Key Factors Generated from the Strategic Network Model

In order to answer our first research question, we generated a research framework for analysis based on the strategic network model. According to the above-mentioned strategic network model (Gulati et al 2000), the following five issues were identified:

1. Industry structure.
2. Positioning within an industry.
3. Inimitable firm resources and capabilities.
4. Contracting and coordination costs.
5. Dynamic network constraints and benefits.

These five issues are called relationship dimensions in Table 1. For each dimension, we collected from Gulati et al. (2000) a typical set of a few concrete key factors characterising each dimension and being hopefully concrete enough to be applied in an empirical study. These factors, which are mentioned in Table 1, will be applied in our ex-post analysis of the case. After the analyses, we will reduce this theoretical list into a more compact checklist of important issues to be considered when developing a partnership-based ASP service integration.

Table 1. The Five Relationship Dimensions generated from the Strategic Network Model

Relationship Dimensions	Key Factors
A) Industry Structure	<ul style="list-style-type: none"> - Network structure (density, holes, equivalence) - Network membership (status of industries, limits on firms' entry) - Tie modality (strength of connections, rules and norms, opportunism)
B) Positioning within an industry	<ul style="list-style-type: none"> - Intra-industry strategic groups or 'cliques' - Positions of the participants (core vs. peripheral) - Mobility barriers
C) Inimitable firm resources and capabilities	<ul style="list-style-type: none"> - Key resources and capabilities of the participants - Network resources - Capability of managing the alliance and extracting value
D) Contracting and coordination costs	<ul style="list-style-type: none"> - Motivation of the participants - Available alternatives for the participants - Trust and reputation effects
E) Dynamic network constraints and benefits	<ul style="list-style-type: none"> - Lock-in and lock-out effects - Alliance portfolios of the participants - Exogenous or endogenous changes in the network

3. RESEARCH METHODOLOGY

The research was conducted using an exploratory single-case study design. Since it is often very hard to get detailed information about failed projects, the case can be seen as an extreme case and as a revelatory case. An embedded approach was used. First, the causes of failure were determined on the basis of interviews of representatives of both companies involved. Then, the sets of key factors presented in Table 1 were considered and a new list of potential causes was developed. Comparing these two outcomes, conclusions were made regarding the important new issues proposed by the network model applied. Finally, a general checklist of important relationship-based issues was built based on the findings.

3.1 Data Collection

According to Yin (1994, p.91), a major strength of case study data collection is the opportunity to use many different sources of evidence. In this case study, three different sources of evidence were used: documents, interviews and participant observation.

The documents included a comprehensive archive of official agendas, presentations and minutes from project team meetings. They also included two co-operation contracts that were signed between the companies. Additionally, the material available to the authors included other unofficial documentation produced by both companies. One of the authors worked as a project manager for the project in the software company for the whole course of the project. During this period, he had participated in dozens of official and unofficial project meetings.

Both authors carried out interviews in the companies. The independent author interviewed in open-ended 2-hour interviews, two representatives of the strategic and development management of Softco to better understand the background history and competencies of the company. The interviews were documented and checked by the interviewees. The other author, on his side, carried out a 2-hour interview of the telecommunications operator's responsible project leader and made a few verifying interviews with the software company's specialists. Also these interviews were documented.

The last phase was the reconstruction of the case according to the factors listed in the five dimensions of our framework and then the compression of these into final recommendations. Both researchers made their evaluations independently, and the outcome is presented as our conclusion.

4. CASE DESCRIPTION: THE DELTA PROJECT

4.1 Background Information of the Participating Companies

SoftCo was established in 1990 as an in-house supplier of IT services for a regional, mid-sized industry corporation. During the first ten years, it concentrated on system integration and IT consultation services. In 2000, SoftCo separated from its parent corporation and bought two smaller companies specializing in Internet-based software. The company wanted to move from the area of traditional IT services into the more lucrative software product business. In 2000, SoftCo had 20 employees and a turnover of about

2 million euros. The company aimed to multiply its turnover during the following three years.

TelCo was a major Scandinavian national telecommunications operator with an aim to become a global player in the market. *TelCo* had decentralized its operations into several independent business units. In this way *TelCo* hoped to promote the development of new business models and leverage the convergence of telecommunications and information technology in the form of new products and services. At least two different business units of *TelCo* were experimenting with new ASP services.

4.2 The Delta Project

The aim of the Delta project was to create an ASP concept targeted at very small companies (typically with 1-10 workstations). The service would cover the most essential business applications that a small enterprise needs. The customer would have access to the service via the Internet for a monthly per-user fee.

In the beginning of the project, the contents of the package were based on the modules that *SoftCo* had already developed: sales force automation, invoice processing, project management and hour reporting applications. However, the ultimate target was to build a much more comprehensive and tightly integrated package that would cover also i.a. accounting and material management. Two important points were identified when the selected target segment was analysed:

- Because the chosen target segment consists of companies that typically do not have their own IT organization and have limited computer abilities, the service must be very simple to use.
- The target segment is very cost-sensitive, so the service must be aggressively priced. A monthly per-user fee is preferred, as the pricing policy must be easy to comprehend.

The customers would only need a web browser to use the applications. The service should perform well even with modest communication lines (modem or ISDN). The software would have to utilize the hardware resources effectively: one server should be able to serve hundreds of simultaneous users. Because of these requirements, the project team ruled out the possibility of using streaming technologies such as Citrix Metaframe. The opinion of the project team was that streaming technologies waste considerable amounts of both server and communications capacity compared with well-constructed web-native solutions. Because of the cost-effectiveness requirement, it was also decided that the process of adding a new customer to

the system should be partly automated and not take longer than 15 minutes. This caused strict requirements for the administration processes and tools.

The project aimed at cost-effectiveness through high customer volumes. Even with aggressive pricing, the service would be very profitable if there were enough users. The idea was to deliver the service to thousands of users from one standardized environment. The software would not be customized at all for individual customers.

4.3 The Onset of the Project

Because SoftCo was developing browser-based software that could be delivered over the Internet, they identified ASP as a possible business model for reaching their expected growth rates. The alternative of partnering with a company that already had an extensive sales force seemed inviting. Telecom operators seemed a good choice for a partner because of their experience in producing and selling high-volume network services and also because of their administrative infrastructure regarding, e.g., small customer invoicing. SoftCo also thought that the strong brands and the massive customer bases of the telecommunications operators would help in reaching high volumes of sales for the service.

In early 2001, SoftCo found out that TelCo - one of the biggest operators in the region - had a suitable project going on. The project team had already invested in the required service infrastructure consisting of server hardware and middleware applications. They had experimented with simple application solutions such as web-based email and calendar services. Now they were looking for more serious business applications. After a few meetings and demonstrations, the teams decided to establish an alliance for the project.

The software developed by SoftCo seemed to fit the architecture in which TelCo had invested. The applications were written in Java, and standard SQL was used for database support. However, the software modules that SoftCo had developed were not integrated with each other. It was then decided that the applications must be integrated on both database level and user interface level so that they would appear to the user as different parts of a single application.

4.4 Responsibilities Between the Parties

TelCo agreed to take responsibility for the hosting infrastructure, marketing and sales operations, customer invoicing and primary customer support. SoftCo would be responsible for developing the new software as well as taking care of secondary customer support, in other words problem situations

caused by the software. Both parties would be operating at their own risk. Revenues from the new service would be divided on a 50/50 basis among the parties.

4.5 The Development Project

A cooperation agreement was signed between the companies in August 2001. Thus the work commenced in SoftCo regarding both integrating the existing pieces of stand-alone software into each other and adapting the software to the platform of TelCo. A pilot installation with two of the applications running in TelCo's environment was completed in September 2001. It soon turned out that the integration task was much more demanding than initially foreseen. Nevertheless, the teams were getting along very well and their cooperation seemed almost seamless.

In early 2002, with the first phase of the project still underway, the companies started planning the next phase of the project. This new phase would include more features, including financial package functionalities. The idea was to have accounting companies integrate Delta into their own services and thus act as a sales channel for the software. The customers would use Delta for processing their sales and purchase invoices, but the accounting company would do the actual accounting. At that time, the target was set to have the first phase of the project completed and released into production by the summer.

4.6 Preparing for Production

After several re-schedulings, the first phase of the project was finally completed six months late from schedule. SoftCo's time estimate regarding the integration of the stand-alone applications turned out to be overoptimistic. The delay was increased by problems in the J2EE application server environment of TelCo. Some of the features of the application server (among others, session management and proxy features) did not fully conform to J2EE standards. This non-conformance had to be circumvented by writing lots of additional code.

In November 2002, the system was finally ready for production. By that time, more than 120,000 lines of new code had been written. According to one estimate made by an external consultant based on the COCOMO-model (Pressman, 2000, pp.135), this would represent 34 person-years of development. After a rigorous testing procedure, TelCo confirmed that the system was robust and scalable enough to accommodate hundreds of simultaneous users from a single server. The first meetings between SoftCo and the sales organization of TelCo were held in October. Although the sales organization

wanted some time to get things up and running, both teams believed that the following year would be a breakthrough for Delta.

4.7 The End

In late 2002, TelCo was going through major changes in its organization. TelCo's representatives initially convinced SoftCo that the Delta project would actually benefit from the new situation. However, in a project managerial team meeting that was held in January 2003, TelCo announced that the situation in the company had changed dramatically. The company would retire from all its ASP activities, including the Delta project. TelCo explained that this was because the corporation as a whole had decided to withdraw from all projects that did not belong to its strategic focus area and had negative cashflow.

4.8 The Aftermath

For SoftCo, the premature ending of the project had a shocking effect. For more than a year, almost half of the personnel in the company had been allocated to the Delta project. The turnover of the company was considerably lower as there was no invoicing for the work done in this project. All the expectations had been placed on the future, as SoftCo expected that sales of Delta would start in 2003. SoftCo was forced to refocus its operations. Luckily, the company was financially solid. It had not completely abandoned the integration and consultation services, which became once again their focal business. In early 2003, SoftCo signed a channel partner contract with one of the leading global Enterprise Resource Planning software companies. The intellectual rights for the software created in the Delta project were owned by SoftCo, but it decided not to market this software via the ASP channel on their own. Instead, some of the applications found a new life as add-on products for the ERP system. In 2003, SoftCo sued TelCo for breach of contract. The legal proceedings ended one year later as SoftCo won the case against TelCo.

According to its new, curtailed strategy, TelCo has returned to its roots as a telecommunications operator. TelCo's project team was quickly disassembled: some of the employees were relocated internally, others left TelCo.

5. ANALYSIS OF THE CASE

5.1 Single Company (Atomistic) View

SoftCo seemed to select a really high-risk approach in the Delta project as it devoted the major part of the software development resources to this single project, especially as the first income would have been their part of the revenue generated. Before this revenue could be collected, the partners would have to complete the development project, get the online service up and running as well as find the customers for the service. However, should the planned ASP approach have succeeded, this new business area would have become very profitable for SoftCo. For TelCo, both the risk level and the expected rewards were much less significant compared with the size of the company.

Regarding the delays in the project schedule, SoftCo seemed not to have sufficient resources to complete the project on time. The management should have understood the disparity between the schedule and the amount of work, on the one hand, and their existing development resources, on the other. While SoftCo had experience in developing professional tailor-made software, it had no previous track record in developing standardized software packages. However, the software system was eventually shipped and approved by TelCo for production use before it withdrew from the project. Thus the delay as such cannot be taken as the main explanation for the failure.

The functionality of the application software was not selected on the basis of any kind of market research or other reliable indication of the actual customer needs. Rather, the applications were selected because they happened to be there. It seems that a major weakness in the execution of the project was that the companies were developing the product without having any 'real' end customer representative of the target market participate in the project.

When a project fails, it is not uncommon for the participants to start blaming each other for the failure. Quite as often, the participants fail to see that maybe they themselves could have done some critical activities better. Project Delta was no exception. After being sued by SoftCo for breach of contract, TelCo claimed that SoftCo had miserably and maybe intentionally failed in fulfilling their part of the contract. SoftCo's managing director was equally bitter:

"The TelCo guys were constantly adding new features to the requirement catalogue while demanding us to keep the previously agreed schedule. Their testing procedure was so scrupulous that probably none of the

shrink-wrapped software products in the market would have passed those tests. What comes to the marketing efforts they promised us, we never saw anything realized.”

5.2 Case Analysis Based on the Research Framework

- a) *Network structure.* In fact, there was no structural equivalence in this mainly bilateral partnership. One of the partners (TelCo) was clearly the real core company, having the possibility to establish and maintain similar partnerships with other software developers. TelCo had several other partnerships that did not help SoftCo at all. SoftCo was in the position of an almost peripheral company, and had believed too much in the core company’s market brand and competency in marketing. Unintentionally, the network was missing a key member: the customer for the new software. Regarding the tie modality, obviously the strength of the coalition was not the best possible as the partners were in an opportunistic relationship and could not benefit from their earlier interactions with their existing industry partners. These had been very important for SoftCo’s earlier success as a business software application developer in its special industry domain. Also, the set of working rules and norms were very different as TelCo and SoftCo represented two different cultures, software innovator versus technical operator.
- b) *Positioning within an industry.* Obviously, there was an asymmetry in the positions of the partners, with TelCo being the owner of the delivery infrastructure, administrative routines, and key customer contacts. On the other hand, TelCo was entering into new competition with large global players; this was a very new situation for a well-doing technology company. Even in the home market, there was another similar new coalition (strategic group) establishing ASP services.
- c) *Inimitable firm resources and capabilities.* SoftCo’s traditional key expertise areas had focused on delivery of professional software development and IT maintenance services, mostly for companies in a certain special industry, based on a business-to-business relation. SoftCo was unable to leverage this industrial knowledge in the Delta project, because the focus changed from customer service into mass products. This area was completely new for SoftCo. Mass production of even simple and small software packages is very different from the service and consultation business. In the ASP service business, there are elements that are closer to the consumer business rather than the B2B business. This was not well understood by either of the companies, and there were no in-

vestments into knowledge transfer and development of common knowledge of the partners. The benefits from the partnership were in fact not synergetic enough. On the other hand, TelCo had no expertise in selling software. Its large customer base could not be benefited from as the main focus of the new software, small enterprises and their business applications, was outside the earlier focus of TelCo.

- d) *Contracting and coordination costs.* It is well known that in the case of innovative software development, the transaction costs may be very high and therefore, a hierarchical ownership-based control is required. In a partnership arrangement, hierarchical control of the other innovation partner is not possible: it will easily spoil the trust. It is very likely that extra costs were caused by TelCo, and this may have resulted in a negative incentive for both partners. Despite of the different backgrounds of the teams and the short history of Delta, the local social networks between the development teams of Telco and SoftCo were working in a feasible way. The problem was that at the executive level of TelCo management, there was no real trust in this cooperation. The contractual formalities (compensations and penalties) had been left open and therefore, the parties could not seriously solve problems as soon as they occurred.
- e) *Dynamic network constraints and benefits.* Typically, lock-in and lock-out effects are the most important factors affecting the shaping of the strategic networks in the longer run. Because of the evolving stage of development, nothing serious can be said about the lock-in effects in the Delta case. However, from the ex-post perspective it was not very smart from SoftCo (and probably from the whole partnership point of view) to sign an exclusive alliance with TelCo. A sub-coalition approach to develop an integrated software package as fast as possible might have been a better strategy.

The above analysis according to our framework revealed several viewpoints that could – and should – have been taken into account before the alliance contract was signed. Most of the five dimensions (especially a and c) were relevant to produce concrete factors that could have reduced the risk associated if taken seriously into account before signing the alliance. We think that both partners of our Delta case were not sufficiently aware of the new complexities involved in the integration process required to offer on-line ASP software services. The complexities seemed to be caused partially by the new ASP offering itself (integration of software development, operations, and customer service businesses), partially because of the more complex management of the network arrangement required to integrate the com-

petencies needed. Many of the factors listed seem to be potential general success factors in any business based on ASP integration. Therefore, in the final section we will summarise our experience with the case study into a more general evaluation of a few key management issues for building ASP services.

5.3 Limitations of the Study

The selection of the case was based on the exceptional access that the authors had to the data. The fact that one of the authors was in a central position in the project being studied and is at the time of this writing employed by the company that participated in the project may have caused some bias of his view. This was eliminated from the results by our arrangement in which both authors as independent researchers generated their lists of factors on the basis of the research framework.

The issue of construct validity was addressed by triangulation of data sources: multiple sources of evidence were used to provide multiple measures of the same phenomenon (Yin 1994, pp.92). To improve the reliability of the study, the material collected for the study was stored in a study archive.

6. DISCUSSION AND CONCLUSIONS

The ASP literature suggests that a multitude of different technologies and competencies are required in order to integrate successful ASP offerings. The more recent proposal to turn the ASP concept into “Software as a Service” (Hoch et al, 2001) makes it even more clear that successful management of online applications from one single point and as online transaction services to mass customers can only be based on a specific network structure (or software ecosystem) where the palette of all required competencies are economically available. Therefore, the tendency to form alliances and strategic networks in the ASP industry is clear. The networked nature of the ASP industry makes it an interesting candidate for being studied through a network-theoretical lens.

In our particular case, the new insights and evaluation factors drawn from the general strategic network model turned out to be useful and opened important new perspectives on the ASP market. The five dimensions proposed and the prototypal factors generated accordingly as predictors of success or failure offered interesting and useful concepts not only to objectively evaluate the potential problems caused, but also to better plan and manage any ASP ecosystem.

On the basis of the literature review and our framework we propose that companies planning establish ASP services should learn from the strategic network issues discussed. In addition to management of both product and service, it is important to pay attention to the management of the network of competent partners. This will require design of incentives that work, creation of effective governance mechanisms, investments in the development of knowledge sharing routines, and formal contracting and other lock-in mechanisms for crisis situations. Finally, attention should be paid to the generation of customer value and to the role of the customer as an important member of the network.

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