

Key Success Factors for Delivering Application Services

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Keywords: ASP, Application Servicing, Outsourcing, Critical Success Factors

***Abstract:** The business benefits of the ASP (Application Service Provider) model for delivery of enterprise applications are now widely recognized and include cost reduction and predictability, avoiding the need to retain expensive and specialized technical staff, ability to scale-up and scale-down the system according to current requirements, and other cost efficiencies. Increasingly, the ASP model is regarded as a viable alternative to implementing applications in-house, and many organizations are considering outsourcing at least some of their enterprise applications to application service providers.*

It is now equally clear that the delivery of enterprise applications as a service poses significant business and technical challenges and that these challenges have been largely responsible for the demise of a large number of the original ASPs. More specifically, reliable delivery of application services to a large number of client organizations requires a suitable technical infrastructure that addresses the requirements for customization and integration without creating substantial overheads associated with servicing each client individually. Successful outsourcing of application services is dependent on a number of key factors that include the selection of suitable application services for outsourcing, precise specification of the interface between different components of the internal and external systems, and the ability to integrate outsourced components with components that are operated and managed within the client organization.

In this paper we firstly discuss different types of IS/ICT outsourcing and present a framework for outsourcing of IS/ICT services, processes, and resources. We then examine the various outsourcing options including application servicing in the context of this framework, and identify the key success factors for each type of outsourcing scenario.

1. Introduction

Most industry observers recognize that the massive investment in ERP (Enterprise Resource Planning) systems towards the end of 90s, and more recently in Internet based technologies and solutions has not resulted in corresponding improvements in productivity. Today, most enterprises exercise tight control over IT budgets, and attempt to maximize already available computing resources and use outsourcing to reduce the costs associated with the development of enterprise applications. The main argument for outsourcing is that it alleviates the need to own and maintain extensive and costly computing resources, allowing organizations to focus on their core competencies. However, traditional outsourcing suffers from many of the same limitations as in-house implementations of enterprise applications [Feuerlicht, Vorisek,

2002]. Application servicing provides an alternative to traditional outsourcing with ASPs (Application Service Providers) delivering application services over the Internet or over a private network.

The ASP model has a proven track record with relatively simple application services such web hosting, email, document management and some simple enterprise applications (e.g. sales force automation, and human resources management). More recently, leading application vendors including Oracle, PeopleSoft, SAP, and Siebel started offering their ERP and other enterprise applications for *rent* as an alternative to purchasing a license and implementing the application in-house. Unlike the simple applications mentioned above, ERP systems have complex integration requirements, (both intra and inter-enterprise), and require customization that reflects specific business practices of the client organization. Both of these requirements (i.e. integration and customization) are difficult to address in practice, and in majority of cases application services are delivered without any significant customization and without any means to interoperate with other enterprise applications. Thus the benefits associated with application servicing are to a large extent offset by the having to accept a standardized solution that may not fully suit the business practices of the organization. Furthermore, while application servicing is simple in concept, closer analysis reveals a complex set of requirements and outsourcing options that make the successful deployment of this model of application delivery highly challenging in practice.

We have discussed the technical and business requirements for application servicing of enterprise applications in a previous paper [Feuerlicht, Vorisek, 2002], arguing that application servicing is substantially different from other forms of outsourcing and that it requires a suitable architectural framework to provide a viable alternative to the traditional model of application deployment and delivery. Another important consideration concerns the suitability of applications for outsourcing in the form of application servicing. It is now evident that the ASP model is not appropriate to all types of enterprise applications, for example specialized applications that support some core business functions may not be suitable candidates for outsourcing to external application service providers. Enterprise applications with extensive integration requirements are also not suitable for application servicing, as currently available technology does not provide satisfactory solution to integration across outsourced systems.

The success of an outsourcing solution will critically depend on a number of key factors that include the choice of the subject of outsourcing (i.e. choice of services, processes, and resources to outsource), the extent of outsourcing (complete or partial), and a range of other factors. It is clear that outsourcing decisions cannot be made without understanding the implications of these factors in a specific outsourcing situation.

In this paper we firstly discuss different types of IS/ICT outsourcing and present a framework for outsourcing of IS/ICT services, processes, and resources (section 2). We then examine the various outsourcing options including application servicing in the context of this framework, and identify the key success factors for each type of outsourcing scenario (section 3). The final section (section 4) is a summary of the main conclusions.

2. Outsourcing Options

A key factor that determines success of organizations in today's business environment concerns finding the optimum level of cooperation between supply chain partners. In order to achieve this optimal level of cooperation one must address the question of identifying, which components of enterprise IS/ICT should be developed using internal resources, and which components should be outsourced to external partners.

In order to allow a detailed analysis of this problem, and to show the position of application service providing (ASP) among other types of outsourcing, it is desirable to first determine and structure services, processes, and resources as show in Figure 1.

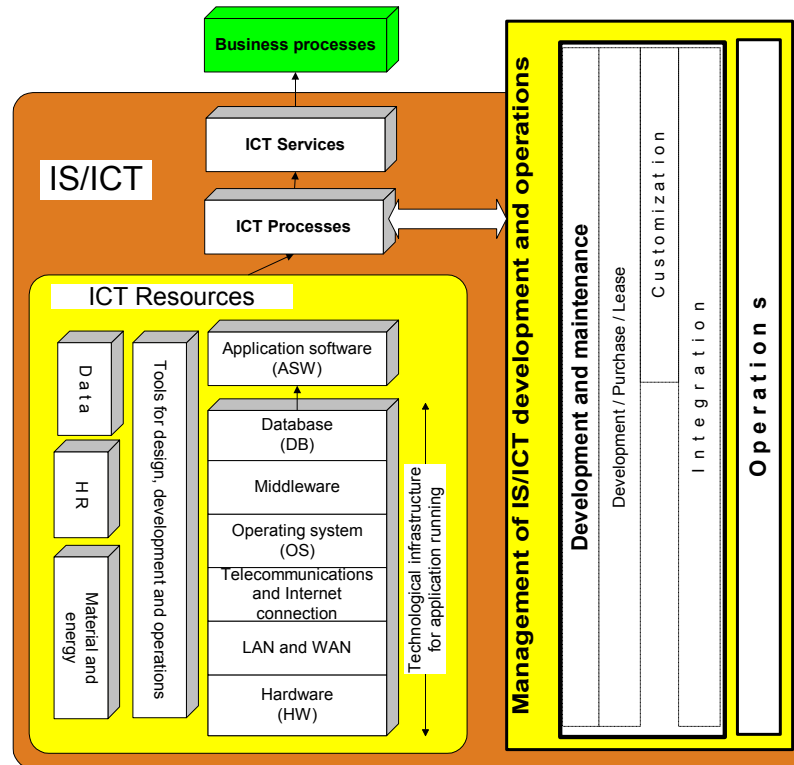


Figure 1: Framework for outsourcing of IS/ICT Services, Processes, and Resources

As shown in Figure 1 above, business processes are supported by information services, and information services are the results of information processes, which consume information resources.

Information resources include technological infrastructure for operating enterprise applications (hardware, networking LAN/WAN, telecommunications resources including Internet connection, operating system, middleware, and database management system). Enterprise applications supported by this technological infrastructure (application software, ASW) implement the required functionality of information services, and support end user access. Application software is developed and maintained using tools for the development, maintenance, and operation of enterprise applications. Enterprise applications facilitate access to organization's data resources. Information processes consume required resources and are supported and managed by ICT personnel. All information services are dependent on corresponding information processes and resources. The key question is which of the required business processes should be supported by the enterprise itself internally and which business processes should be delegated to external parties (i.e. outsourced).

2.1 Types of Outsourcing

The above discussion leads us to classify outsourcing into various types according to the subject of outsourcing, i.e. according to what responsibilities and related activities are being passed on to an external provider. From this point of view we can identify four basic types of outsourcing:

- a) Business process outsourcing (BPO)
- b) Complete (complex) outsourcing of IS/ICT
- c) Partial outsourcing of IS/ICT
- d) Outsourcing of IS/ICT development

Outsourcing implies handing over processes, services, or resources to an external provider, and always involves changes in responsibilities (from the client company to an external supplier), and often also involves changes in the ownership of resources. We note that changes in ownership can also arise through acquisitions and renting of products or services; we do not consider such changes in ownership in this paper. The interface between the enterprise and external supplier is defined using a Service Level Agreement (SLA) and SLA conformance is measured using SLA metrics. We use a *clock dial* in the following figures to indicate this interface.

2.1.1 Business Process Outsourcing (BPO)

Business process outsourcing involves handing over the entire business process, i.e. all activities and related resources, to the external provider. It is possible, but not very common for the resources to remain with the client company during this type of outsourcing. In most cases all services, processes, and IS/ICT resources supporting these processes are also outsourced as illustrated in Figure 2. Typical examples of business process outsourcing include handing over transport, catering, or accounting services to an external provider.

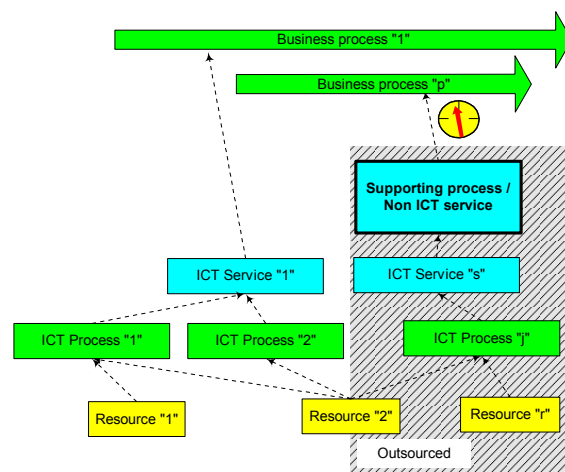


Figure 2: Business process outsourcing

The management of the supporting process including its IS/ICT component is the responsibility of the provider of the service. The service provider is also responsible for the customization of the business process so that the produced output has content, volume, and quality that are in accordance with the SLA.

As the outputs of the outsourced business process become the inputs for one or more core business processes, the integration of the outsourced process must be ensured by the company. Similarly, the outsourced component of IS/ICT must be integrated with the internal IS/ICT system.

The main benefit of this type of outsourcing is that the client company is released from the responsibilities associated with a non-essential process and can better focus on its core activities. This leads to more effective utilization of company's resources. The key success factor for BPO is the level of integration of the outsourced process with internal business processes.

2.1.2 Complete IS/ICT Outsourcing

The second type of outsourcing is complete IS/ICT outsourcing. In this case the service provider takes on responsibility for the development and operation of all of the information services and the associated information processes and resources, as illustrated in Figure 3 (also shown as the IS/ICT component in Figure 1). But, unlike in the case of BPO, the service provider does not take responsibility for business processes that the IS/ICT supports. Consider the example of outsourcing an entire IS/ICT system including applications that support the accounting function, with the actual accounting function remaining internally managed.

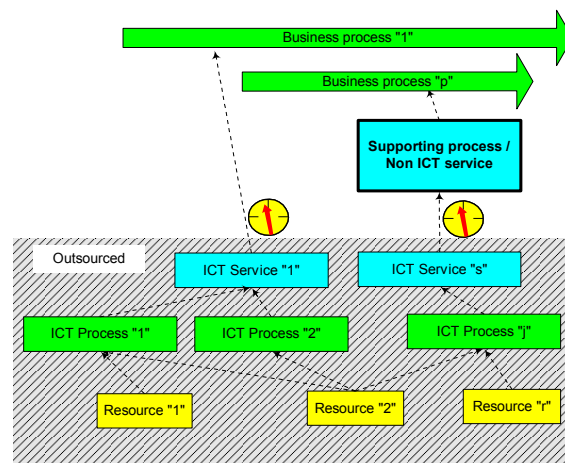


Figure 3: Complete IS/ICT outsourcing

It is the responsibility of the service provider to support the development and operation of IS/ICT (including the customization and integration of all resources, processes, and services) to ensure that the client receives all information services as specified in the corresponding SLAs.

The main advantage of this type of outsourcing is similar to the benefits of BPO – the client company is fully relieved from the problems of having to maintain IS/ICT technologies and personnel, and can devote additional resources to their core business activities. Detailed discussion of the advantages and challenges of this type of outsourcing is given in [Bruckner, Voříšek, 1998].

2.1.3 Partial Outsourcing of IS/IT

The third type of outsourcing considered here is partial outsourcing of IS/ICT, where the provider may take responsibility for:

- *Selected information services*, including the support of related information processes and resources as illustrated in Figure 4. Examples of this include outsourcing of the operation of ERP system, electronic mail services, etc.
- *Selected information processes*, including resources that are required for their operation as illustrated in Figure 5. For example, the implementation of ERP system by an external firm, outsourcing the integration of all company's enterprise applications, etc. It is important to differentiate this type of outsourcing from the outsourcing of information services; in the case of information process outsourcing the provider is responsible for part of the activities within the information services, not the support for the entire information service.
- *Selected information resources* – as illustrated in Figure 6. For example, outsourcing of end user workstations, outsourcing of data centre, etc. In the case of resource outsourcing it is common to also outsource the activities associated with the operation, management, and further development of the resource. Typical activities include the acquisition/development, maintenance/upgrading, customization, and integration of the resource with other resources, and eventual disposing off/liquidation of the resource. The framework illustrated in Figure 1 can assist in making decisions about which information resources are suitable for outsourcing. For example, outsourcing of a single resource (e.g. a single information infrastructure layer) may not be effective, but outsourcing of a group of layers that form the technological infrastructure for the operation of applications could be beneficial.

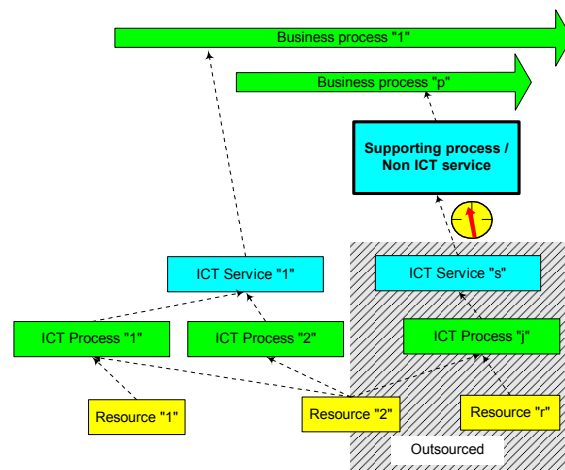


Figure 4: ICT Service outsourcing

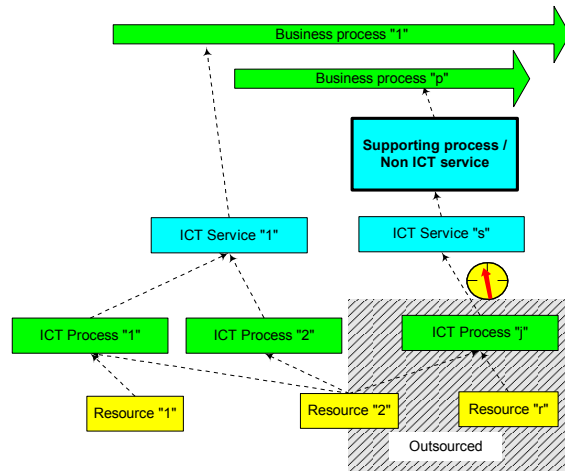


Figure 5: ICT Process outsourcing

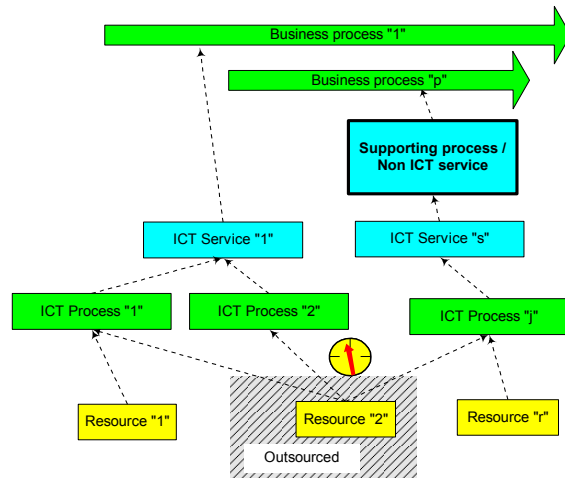


Figure 6: ICT Resource outsourcing

Important advantage of partial outsourcing is that it enables detailed planning and management of IS/ICT. The client company can use partial outsourcing to selectively outsource information services, processes, and/or resources that can be provided externally with better quality and cost effectiveness than provided by internal implementation.

A key critical success factor is the integration of the entire IS/ICT system that remains under the responsibility of the company. The importance of this critical success factor grows with the number of external providers involved. Another critical success factor is the quality of definition of the interface between the client company and an external service provider as specified by the SLA. SLA specification needs to focus on the description of the interface, not on how the responsibilities of the external provider will be fulfilled. For example, when outsourcing information service the SLA must have a precise specification of the content, volume, and quality of the service, but should not specify the resources used by external provider to deliver the service (i.e. hardware, software, etc). This avoids having to employ

technical specialists whose task is to monitor such resources, and allows the service provider to reuse the same SW/HW resources across a number of client organizations reducing the overall cost of the solution.

Given that in a typical enterprise IS/ICT environment there is potentially a large number of information services, processes, and resources, the number of permutations and various combinations of partial outsourcing scenarios is extremely large. We do not intend to give a detailed analysis of such options here. We will however note one important option – situation where the subject of outsourcing is one or more complete information services – *it is this situation that we describe as ASP*.

It is possible for an external service provider to take advantage of partial outsourcing, or outsourcing of the development of IS/ICT, resulting in so called second level outsourcing.

2.1.4 Outsourcing of IS/ICT Development

The fourth type of outsourcing is concerned with outsourcing only some of the development of IS/ICT resources, which are then operated by the client company. Usually, this type of outsourcing also involves the maintenance, upgrades, customization, and integration of resources. The client company is then only responsible for the operation of the resource and its optimal utilization within enterprise information processes. The most widely used example of this type of outsourcing involves the procurement of the development of application software. We can also include in this category externally provided training of ICT personnel, as this type of training enhances one of the information resources – the ICT personnel resource.

We can also consider additional sub-categories of outsourcing of IS/ICT based on individual phases of the SDLC (Systems Development Life Cycle), i.e. feasibility study, high-level requirements analysis and design, detailed analysis and design, and implementation, or possibly life cycle phases specific to other information resources.

Outsourcing of development of IS/ICT can be also of benefit to organizations that operate their entire IS/ICT environment using internal resources, as this enables the utilization of capabilities and know-how of external providers in situations where their own capabilities are not sufficient for the task. Critical success factors for the outsourcing of IS/ICT development include high quality of requirements specifications, and the maintenance of the outsourced resource in the face of changing requirements and operating conditions.

2.2 Types of outsourcing according to ownership and location of resources

In addition to the subject of outsourcing (i.e. what is being outsourced) we also need to consider the question of ownership of resources that are used to implement the subject of outsourcing. The provider of the service does not have to necessarily own all of the required resources. For example, a company may operate its IS/ICT systems, but the servers and end user workstations could be rented from an external provider. Similarly, information services could be provided by an external provider, but the required hardware and software platforms could be owned by the company, or possibly the hardware and software resources could be owned by a third party. It is clear from the above discussion that the ownership of a resource and responsibility over a business process that utilizes this resource are two separate issues. Ownership issues belong into the financial/legal domain.

The key IS/ICT outsourcing issue from a legal point of view is software licensing. In situations where the software used for outsourcing is extensively customized, and therefore cannot be used by the external

service provider for other clients, it may be advantageous for the client company to hold the software license, even if the application is operated by the service provider.

From financial point of view we need to consider mainly the question of depreciation and tax liability. Smaller service providers may find that depreciation associated with assignment of assets from the client company may represent significant financial load that could have negative impact on their financial results. In some cases service providers prefer that the hardware and software resources remain in the ownership of the client company, and that only additionally acquired resources (i.e. new hardware and software) are owned by the outsourcer.

Similar to ownership of resources the location of resources can be resolved in a number of different ways. One possibility is to centralize all hardware and software resources and place them within the client organization, or on the premises of the external provider. In addition to these two simple centralized solutions a number of combinations are possible, for example the database server could be located with the client organization and the application server with the external service provider, or even with a third party.

The criteria that determine the location of resources include the requirements on availability of service, response time, security, reliability, and cost of operating and managing the resource in different locations. In the specific case of the ASP outsourcing model it is common for the external provider (i.e. ASP) to own all of the resources required for supporting the information service. The resources are most often collocated with the ASP.

3. Key Success Factors for Different Types of Outsourcing

The discussion in previous section illustrates the various outsourcing options and the potential complexity of outsourcing scenarios. Each outsourcing scenario has its advantages and drawbacks; outsourcing decisions require careful analysis to determine which option provides the best alternative. For example, using a combination of two separate ASPs, one for the Database layer, and another for the Application layer may provide the least costly solution and best service level parameters, but excessive integration requirements may outweigh such benefits. The outsourcing framework presented in section 2 (Figure 1) enables making informed decisions about which components of the system should be outsourced and which type of outsourcing should be used, in the context of critical success factors for each type of outsourcing.

Business Process Outsourcing (BPO)

The success of BPO depends to a very large extent on identifying a suitable business process, and the precise definitions of the interface between the outsourced business process and the internal business processes. The key success factor for BPO is the minimization of integration requirements between the outsourced process and the internal processes.

Complete IS/ICT Outsourcing

Complete IS/ICT outsourcing involves the service provider taking over responsibility for the development and operation of all of the information services and the associated information processes and resources. The critical success factor for this type of outsourcing is the ability of the external provider to develop,

manage, and operate a complex IS/ICT environment with high level of reliability and efficiency. The precise definition of service level parameters is of key importance here.

Partial Outsourcing of IS/IT

Using this type of outsourcing involves the external provider in taking over responsibility for selected information services, processes, and resources. A key critical success factor is the integration of the IS/ICT system that remains under the responsibility of the company with the externally managed and operated components. As with previous types of outsourcing the quality of definition of the interface between the client company's system and the externally managed components also plays a key role.

Outsourcing of IS/ICT Development

Outsourcing the development of IS/ICT system, or part of the development life cycle to an external service provider involves an interface between the client organization and the external provider in the form of requirements specifications. The critical success factors for this type of outsourcing include quality of requirements specifications, and the ability of the provider to maintain the outsourced resource in the face of changing requirements and operating conditions.

4. Conclusions

To maximize return on investment, outsourcing needs to be selective and consequently the outsourcing framework needs to support outsourcing of subsets of enterprise applications and resources. For example, an organization may choose to outsource the CRM system, but retain their ERP system inside the company to be managed by internally. This type of solution results in integration requirements and needs to be carefully evaluated, identifying both advantages and drawback of such a solution.

Application servicing represents a completely new paradigm for enterprise computing and necessitates re-thinking of the entire approach to IS/ICT implementation and deployment. This includes methods for application development, delivery, and integration. Outsourcing requirements of an organization have to be evaluated in the context of existing and future needs of the enterprise, and considerations should include both technical issues (integration with existing enterprise applications, customization requirements, etc) and business issues (managing complex multi-party relationships, etc). This evaluation needs to be conducted within a framework that describes the various outsourcing options, and helps to define the interface between internally and externally provided resources. Without understanding the various outsourcing options and evaluating their implications in a specific enterprise-computing scenario, outsourcing projects run a high risk of failure.

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