SOA : To Do or Not to Do
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Abstract
As business moves from Web services to SOA, adoption and successful implementations of SOA become more evident. The goal of SOA is to provide friction free interactions between systems and to align IT and Business in an enterprise. Documenting hurdles and problems in the use of SOA will help consultants, architects and specialists to avoid repeating the same mistakes and learn how and when to use (or not use) SOA at the enterprise level. The circumstances when SOA is a pertinent solution and when it is not that are described in this article are based on the authors’ personal experiences, best practices available in the SOA community and examination of past and current SOA engagements. Using Service Oriented Architecture does not guarantee success to the enterprise.

Introduction
In recent years, business has become global and increasingly competitive. New technologies have enabled business improvement in this highly competitive environment. Several recent developments in the software industry have helped to bring SOA further into the forefront. With personalized client/server, Web-based and portal-style user interfaces, an increasing number of projects require reuse of application business logic over multiple access channels. SOA fever is reaching peak level in the IT industry. Every organization is inclined to implement SOA at the enterprise level as more and more businesses realize the benefits of SOA and the modular approach to enterprise architecture.

SOA focuses on existing IT investments and on providing systems and applications that can accelerate the efficiency of business processes. Recently, many enterprises have adopted SOA technology and architectural principles and rolled out new SOA infrastructures. A Report by Gartner (1) makes the following predictions concerning the use of SOA:

By 2008, SOA will be the prevailing software engineering practice, ending 40 years of domination by monolithic software architecture.

By the end of 2008, most businesses will combine elements of SOA, EDA and monolithic architecture in their enterprise software development projects.

The future of SOA is pitched along with BPM (Business Process Management). Over the next two to three years companies will see their complete business process “patch up” with a combination of SOA and BPM.

SOA software from IBM, Oracle, SAP and other providers needs to work together without requiring complicated integration and interfacing – organizations want less complexity, not more.

Organizations need to respond to some major questions before launching and SOA initiative. They are:

- Is SOA the right solution?
- What SOA approach is the best for the enterprise environment?
- What business opportunities is the enterprise is pursuing?
- Is Re-usability a requirement?
- What is currently working and what is not working?
- What are the various options available in the future?
- Who should have access to data?
- Can we prioritize the requests and transactions?
What value is delivered to the enterprise by implementing an SOA?

There have been numerous articles and blogs discussing SOA best practices, designing good services, and a robust supporting backbone. The following sections of this article summarize, when to adopt SOA and when not to use SOA.

**SOA Perspective**

SOA is a concept that defines business functions as services which, when combined, provide end to end business value.

![SOA Diagram](image-url)

**Figure 1**

SOA is an approach to software development in which--,

- Services provide reusable functionality.
- Applications are built using available service functionality.
- Services can exist on different systems in different locations.

SOA based application design is the best fit for new multi-channel and composite real time applications.

In an SOA, we move away from integrating different pre-built systems to building systems that are meant to be integrated by virtue of how they are defined and implemented.

SOA is different from Traditional approach. A primary goal of SOA is to handle unpredictable changes. A conceptual level comparison between Traditional approach and Service Oriented approach is depicted in the following table.
When to Do SOA

The following are the factors within an organization which are favorable to the adoption of an SOA solution.

- The organization has a need for data to be widely distributed. Locate the logic that manipulates the data, wrap it as a service and make it accessible from anywhere.
- The majority of the enterprise processes can be automated by adopting SOA.
- The primary business of the enterprise does not revolve around extremely high volume and/or synchronous real time transactions.
- The organization has a need for functionality to be highly available. Deploy the functionality as services in multiple, redundant providers so that some are available even when others are not.
- The enterprise is in an acquisitions mode. SOA implementation facilitates mergers and acquisitions. Mergers and acquisitions are a central enterprise business model for growing a market share and pursuing new business opportunities.
- The organization requires solutions that can integrate business capability from disparate systems and programming models.
- The organization needs to reuse functionality and data from multiple applications. Services enable separate applications to reuse a shared set of enterprise data without having to distribute the data to all applications.
- An organizational goal is to align business and IT functionality. SOA eliminates redundancy. It allows the service consumer to choose alternative service providers based not only on functionality but also on design choice and runtime policies.
- The organization wants to eliminate the overhead of ubiquitous and simplistic standards. SOA middleware and tools will be used to optimize the middleware operations and allow substitution of protocols and technologies.
- The organization wants to enhance business and technology agility. SOA enables independent evolution of process logic and application logic. Implementing processes by composing them from existing services reduces cycle times.
• SOA helps to reduce costs. IT costs are reduced through reuse of internal systems at the enterprise level. With an SOA implementation in place, the pursuit of new business opportunities is facilitated, offering an additional benefit to ROI.

• SOA creates the opportunity for incremental development and deployment of business software. It helps in reuse of business components in multiple business applications of the enterprise. Wrapping a service is an excellent way to get reuse out of applications that are already delivering value to business.

When Not to Do SOA

• Following are factors within the organization which legislate against the use of an SOA solution.

• The organization is small and operates with a homogeneous network and technology confined to a single vendor.

• The organization does not require standards based integration. Product vendors are promoting a complex SOA stack as a solution for large enterprises where integration is a requirement. Some enterprises may not need choreography, BPEL engine and Orchestration. Instead, the solution might be a simple data exchange between applications and external systems.

• The organization cannot afford the cost of implementation. Many SOA stack based solutions require their own application servers, BPEL engines, and Process Servers—a major cost to the enterprise.

• The organization requires systems where response times are critical. SOA’s are not suitable in such environments. Tight coupling architecture is the better solution for improving response times.

• The organization does not need to change the existing legacy system. In such a situation, SOA is overkill. These Legacy systems and the applications running on them perform better as long as they are not messed up.

• If the business logic, presentation, data flow, process, or any other aspect of the application do not require significant change,, converting these giants to an SOA might not return sufficient value.

• Architecting loosely coupled services of an application to be deployed on a single computer is not cost effective; SOA is not suitable in such circumstances.

Following are some additional conditions that, when present in an organization, are not conducive to the implementation of a Service-Oriented Architecture.

• A small percentage of the enterprise’s IT budget is allocated to integration activities

• The majority of the enterprise processes are manual with little need for automation

• There is a significant gap between enterprise’s existing skill base and that which is necessary to implement an infrastructure to support SOA.

• When a clear business case or opportunity has not been identified that would benefit from the IT capabilities offered by SOA.

• When an enterprise’s primary business revolves around extremely high-volume, synchronous, real-time transactions.
Conclusions

In this article, we’ve attempted to define scenarios both favorable and unfavorable to an SOA solution. Adoption of SOA by an enterprise offers significant advantages: it facilitates quick adaptability to new market trends and establishes the bridge between Business and IT. It provides interoperability and flexibility to the enterprise. In SOA, functional logic is modeled and designed as a software service and is available on demand to other applications. Also, SOA is a possible recommendation when performance is an important requirement and functionality must be widely available and security is important.

SOA is not recommended in these circumstances: for simple development projects; when the IT infrastructure has an application server, a database and couple of Web servers, then SOA may not add any value to the IT investment; when the application is built with a single running process and there is no remote access requirement; when the operational environment is simple and the network is slow.

Further, an SOA is not a suitable solution when the following conditions prevail:

- When business requirements are stable
- When the IT environment is homogeneous
- When the emphasis is on a highly efficient application and less on flexibility

It is the job of the Enterprise IT architecture team to decide when to adopt SOA and when not to adopt SOA, based on an IT strategy assessment.

References

1. Service Oriented Architecture Scenario, 16 Apr, 2003, Gartner
2. Service-oriented modeling and architecture - How to identify, specify, and realize services for your SOA by Ali Arsanjani, 09 Nov 2004, IBM

Glossary of Terms

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