The Movement to Deploy Web Services

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In a recent IT Impact Brief we presented survey results that identified the initiatives that would have the greatest impact on IT organizations over the next year. Web services was close to the top of that list. The attendees at the recent NetScout Users Forum in Boston confirmed the fact that the deployment of Web services is one of the most significant trends that are impacting their organizations.

Given the importance of Web services, this will be the first of two IT Impact Briefs on the topic. This brief will discuss what is meant by the phrase Web services as well as describe what is motivating so many companies to adopt them. A future IT Impact Brief will discuss the management impact of Web services deployment.

The research that went into creating this IT Impact Brief included surveying the NetScout community relative to their company's use of Web services. Throughout this brief the respondents to that survey will be referred to as The Survey Respondents.

Defining Web Services

Over the last few years, the phrase Web services has been used in a variety of ways. In some instances it has been used to refer to any service that was accessed over the Web. In other instances it has been used to refer to having a Web front end to an application.

Today there is virtually universal agreement that the phrase Web services refers to reusable software modules that can be accessed over an IP-based network. Since these software modules encapsulate business functionality, it is helpful to think of Web services as also referring to reusable business modules. Some of the key components of Web services include:

- **XML:** XML was created and is managed by the World Wide Web consortium. It has been widely adopted as a technique to describe data that is shared between applications. XML describes the exact structure of the messages being transmitted; i.e., the sequence of the fields in the message as well as the format of the fields. XML is also a meta-language that is the basis of many other languages. The phrase XML vocabulary means an XML-based language developed for a specific purpose
- **SOAP:** The Simple Object Access Protocol is an XML vocabulary and is the protocol by which data is transported between the device requesting the service and the provider of that service. SOAP provides the platform and programming language independence that allows developers to integrate disparate applications and business processes.
- **WSDL:** The Web Services Description Language is an XML vocabulary that allows developers to describe Web services and their capabilities in a standard manner.
- **UDDI:** The Universal Description and Discovery of Information is a registry (catalog) of available Web services. UDDI is designed to enable software to automatically discover and integrate with services found on the Web.

Survey Results

The survey respondents were asked to indicate how much use of Web services their company had made to date. The survey question used a scale of 1 to 7, where a '1' indicated no usage, a '4' indicated moderate usage, and a '7' indicated significant usage. The survey defined moderate usage to mean that roughly half of their company's ongoing application development and integration activities involve Web services to some degree.

Eighty four percent of The Survey Respondents stated that their company had made at least moderate usage of Web services. In addition, ninety four percent of The Survey Respondents indicated that their company would increase their use of Web services in the next year.

As was previously mentioned, it is reasonable to take a purely software centric view of Web services; i.e., Web services represent reusable software modules. The value proposition of having reusable software modules is that they reduce the time and the cost associated with application development and/or integration, while simultaneously improving the quality of the application.

However, it is also reasonable to take a purely business process view of Web services; i.e., Web services represent reusable business logic. The value proposition of having reusable business logic is that it reduces the time and the cost associated with either deploying a new business process or making modifications to an existing process.

It is instructive to realize that the value of using Web services will increase in time. This follows in part because over time more enabling technologies and standards, such as ones related to security, will be production quality. This also follows because when companies make their first deployment of Web services, they do not have any software/business modules to reuse. However, this situation changes as companies continue to develop Web services.

In order to understand how companies currently view the value proposition of Web services, The Survey Respondents were also asked to indicate which factor or factors were the primary motivator of their company's usage, either existing or planned, of Web services. Table 1 contains their responses.

Please Note: Where Web Services deployment has many interrelated components, the survey questions relating to Tables 1, 2, 3, & 4 all allowed for multiple answers therefore the totals may exceed the common 100% respondent totals.

Table 1 - Factors Motivating Web Services Deployment

Factor	Respondents
The need to be more efficient in the development of new applications	43%
The need to be more efficient in the process of application integration	46%
The need to implement more efficient business processes	60%

The data in Table 1 indicates that there is broad interest in using Web services both for application development as well as for application integration. However, the data in Table 1 clearly points out that the single most important factor driving the deployment of Web services is the need to implement more efficient business processes. This finding was discussed and validated at the recent NetScout Users Forum. In particular, the vast majority of the attendees at the forum indicated that their company was undergoing significant re-engineering of at least one key business process. The attendees also disclosed that in virtually all cases, the involvement of IT was seen as being critical to the success of the process re-engineering initiatives.

The Survey Respondents were asked to indicate if they were buying Web services software off the shelf, or if they were developing it either internally or through the use of consultants. Their responses are contained in Table 2.

Table 2 - Method of Acquiring Web Services Software

	Respondents
Off the shelf	69%
Developed through outside consultants	33%
Developed internally	73%

One conclusion that can be drawn from Table 2 is that companies are using multiple techniques to acquire Web services software and that a significant percentage of companies are accelerating their deployment of Web services by either acquiring this software off the shelf or by using outside consultants.

Those survey respondents who indicated that their company had acquired Web services software off the shelf were also asked to specify the vendors of that software. Their responses are contained in Table 3.

Table 3 - Vendors of Web Services Software

	Respondents
Oracle	62%
SAP	58%
IBM Websphere	52%
BEA	30%
TIBCO	14%

One of the conclusions that can be drawn from Table 3 is that many of the major players in the software marketplace are actively promoting a Web services approach to software development.

Articles in trade magazines often associate Web services with a Service Oriented Architecture (SOA). One of the key characteristics of a SOA is that all functions are defined as services that typically have varying layers of granularity. For example, as part of creating a sales order processing system, a company may create the following three services:

- **Create Sales Order**
- **Obtain Credit Report**
- **Identify User**

As part of this sales order processing system, the 'create sales order' service can invoke the 'obtain credit report' service that can invoke the 'identify user' service.

Another key characteristic of an SOA is that all services are independent in terms of how they perform their function; i.e., the languages and operating systems that are used to create the services. The services are invokable independent of whether or not they are local or remote, and independent of the infrastructure components that it takes to make the connection.

As mentioned, the industry trade magazines often associate Web services with a Service Oriented Architecture (SOA). The reality is that it is possible to deploy Web services and not have an SOA, it is also possible to construct a SOA and not use Web services.

The Survey Respondents were asked to indicate whether their company started by developing an architecture, or started by deploying Web services, or some combination. Their answers are contained in Table 4.

Table 4 - Deployment Approach

Approach	Percentage
We first developed an architecture and are now working to implement that architecture	25%
We got started by using web services to address certain issues and opportunities, and subsequently began to pull together an architecture	28%
We have been using web services to address certain issues and opportunities and have not yet begun to develop an overall architecture	53%

The data in Table 4 speaks to the pragmatic nature of how IT organizations are using Web services. In particular, IT organizations are deploying Web services because they solve critical IT problems.

Conclusions

Given all of the hype surrounding Web services, it would be easy to be cynical. In particular, it would be easy to believe that Web services will never live up to the promises being made in myriad articles in the various trade magazines.

Whether or not Web services can live up to the hype is an academic question. However, the survey data presented in this article clearly demonstrate that driven both by the need to improve software development and integration, as well as the need to enhance business processes, there has been an extremely significant deployment of Web services to date, and that deployment will only increase over the next year. In addition, the combination of the pragmatic nature of Web service deployment, the number of major players that are committed to Web services, as well as the growing value proposition of Web services means that it is difficult to foresee what it would take to cause the movement to Web services to fizzle.

A future IT Impact Brief will detail the management challenges presented by the deployment of Web services.