

Web services is not a collective name for existing services, such as website design or website hosting, but refers to a fairly new technology for integrating applications.

Web services allow different computer systems running different software applications to communicate with each other and conduct transactions over a network, usually the internet. In effect, they act like 'glue' to deliver reliable, automated integration between different computer systems and applications regardless of software or operating system.

Web services are important to businesses because they enable systems across different companies to integrate quickly and cheaply. Ultimately you don't need to know what kind of software your trading partners are running, all the integration happens behind the scenes.

#### THE BENEFITS

Web services can make it much easier for trading partners to link together electronically. They overcome the barrier of different platforms and operating systems and create new business opportunities and a greater degree of business flexibility.

#### Save time, money and resources

- More choice, for lower costs. Because web services are built to common standards, more and more developers are entering the market, increasing competition and bringing down costs.
- Automate routine transactions. Web services can integrate business applications such as stock control and ordering, regardless of the software used or its platform and without the need for costly middleware (the software interface that links other software or systems).

This means hundreds of routine business transactions could be automated, saving time, money and human resources.

- Better-informed business. Web services can be linked to everyday applications such as spreadsheets or databases to provide up-to-the-minute information. For example, changes in the cost of materials could instantly feed through to amended prices in your product website.

#### More efficient and faster ways of doing business

- Flexible, rapid deployment. Web services are fast to build and easy to adapt so they can respond to changing business conditions such as sales opportunities, seasonal promotions and stock prices.
- Repeated use. Web services are developed in an open source language which means they can be altered and repurposed to meet your changing needs.
- Extend the usefulness of existing software. Web services can convert and share data from old software packages, reducing the need to replace, duplicate or upgrade.
- Off-the-shelf or tailor-made. Web services are available as ready-made packages or can be custom made by a supplier.

#### Integrate data from different sources

- Link data into a single source. Do you collect data from different sources, such as online forms, e-mails, data keyed into a database and from phone calls? Web services technology could link these systems together

and provide the basis for a personalised Customer Relationship Management system (CRM).

- Aggregate data from multiple sources. Do you need to analyse data from a variety of different sources to respond to your trading partners or customers? Web services can collate the right data from a broad cross-section of sources to help you make decisions.

#### **Link business processes, internally and externally**

- Link and integrate systems internally. Do you use several different software packages to handle processes such as purchasing, ordering and stock control? Web services technology could integrate data from these systems without the need for complex additional software.
- Make better use of intranets and extranets. Web services will enable users to pull together data from anywhere on your network, regardless of the format it is in. Web services could enable you to collate data from many different websites, for example.
- Work with any potential partner. Ease of integration will mean that businesses can work with outside partners regardless of what software they use.

#### **Flexibility**

- Lease applications. Web services will make it much simpler and more cost-effective to lease complex applications (or elements of them) such as CRM (Customer Relationship Management) or ERP (Enterprise Resource Planning) over the internet from ASPs (Application Service Providers). This will increase the choice of outsourced services available to small businesses.
- Increase the operational scope of businesses.

A web services application for retail businesses could analyse e-mail and SMS sales data and customers' case histories in real time, detecting potentially fraudulent transactions or problems with credit cards. It could also provide an audit trail from each sales channel.

- Accelerate online sales. A web services application could allow customers to access your website, check stock levels and order online in a seamless transaction regardless of what platform your inventory system and ordering system are running on.

#### **HOW DO WEB SERVICES WORK?**

Basically, web services allow any piece of software to communicate with a standardised XML messaging system. XML is a high-level computer language that controls other languages like HTML. It packages computer data, such as orders or product codes in recognisable envelopes. XML (and other XML-based languages) forms a wrapper round the data so that it can be easily read by any other software and allowing machine-to-machine interaction. As XML becomes popular as a basic format for business to business transactions, more web services will be created. XML works with several other computer standards to deliver web services. These include:

- Web Service Description Language (WSDL) an XML-based language used by web services to describe how they should be used.
- Simple Object Access Protocol (SOAP) enables web services to deliver information via the internet, just as the http at the start of a web address enables web pages to deliver information.
- Universal Discovery, Description and Integration (UDDI) a computer-oriented directory that enables computers to find and use the particular web services they need.

### DECIDING TO USE WEB SERVICES

Web services are developing all the time. Because of initial concerns about security, many companies use web services only for internal processes such as intranets and extranets. In addition, the development of common standards for web services programming is currently under discussion.

### SECURITY

Conventional applications transfer data across the firewall-protected business network with secure e-mail and web servers as the carriers allowing them passage. With web services, data flows freely across the unregulated internet. In effect, traditional network 'border controls' have been removed. Several approaches are being developed to combat the risks posed by the free transfer of data and the problem of tracking errors. These are some of the issues you should be aware of when developing or working with web services:

### AUDITING DATA

A typical in-house web services application will enable your stock system to order stock automatically when preset levels are reached. You will need to have appropriate safeguards in place for checking data, since staff will no longer need to intervene in the ordering process.

### PROTECTING DATA

- Use web services over dedicated networks such as VPNs (Virtual Private Networks), with network providers supplying trust and authentication services.
- Web service-based trust services are already being developed by companies such as Verisign, and are beginning to be integrated into web service-compliant software applications.

A trusted web service incorporates mechanisms for confidentiality, data integrity, non-repudiation, authentication and authorisation. To do this, trusted web services incorporate various emerging security standards.

- Be aware of developments: digital signatures are being developed for use with XML. WS Security, a standard format for passing credentials, is becoming widespread, as are internet 'inspection points' where data is checked.

For general information about security within electronic supply chains, take a look at the Security Section of our website.

### THE FUTURE

The uncertainty over web services is not about whether they will catch on the need for easier information movement makes them inevitable. For example, big names like Microsoft, Macromedia, Apple Computer, Amazon.com and Google have all recently unveiled plans for web services.

The more pressing question is how web services will develop between organisations given that much of web services rely on 'non-proprietary' resources shared over the web. How, in other words, will common standards be developed?

Many commentators see a parallel between the current state of web services and the early days of web content. Currently, for example, Amazon provides XML 'feeds' for free. That is, they make information from their database available in XML format for people to incorporate into web services. One company is using this feed to develop a music player that will automatically pull tracklistings and album covers from Amazon's database.

For now, Amazon and other companies are trailing these systems and offering material free

to promote uptake. However, it is likely they will introduce charges in future or restrict access to approved business partners.

Despite the uncertainty surrounding some areas, if your business partner is larger than your own company then you may well benefit from adopting web services. The alternative is to miss out on transactions or the cost savings. Postponing replacement of older EDI-type systems with web services may be costing you money now.

### IMPLEMENTATION CHECKLIST

#### Research & analyse

Set targets

- Set goals for web services for example improved communications with supply chain partners or increased efficiency.
- Agree specific, measurable objectives for what you want to achieve.

#### Cost benefit analysis

- Examine the way you currently work to see how and where web services can add value.
- Using web services to good effect requires a holistic, collaborative approach to working. Is your business based on such a culture and is it ready to trust automated interactions?
- Compare the costs of web services, such as buying applications and training, with the benefits, like greater efficiency and improved customer satisfaction.

#### Consult

- Speak to your trade association and business partners. If they are using web services, they could give you valuable insights.

### PROFESSIONAL ADVICE

If you lack the skills in-house, contact a Business Link adviser, in the first instance, for

help on how best to:

- outline your requirements
- establish how much you can afford to pay
- scope the project
- advise on implementation
- provide training and software support.

#### Plan & test

Evaluate options

- Do you want to develop your own applications or buy off-the-shelf?
- Have you considered the investment in technology and skills required to develop web services?
- Have you costed training and development against buying off-the-shelf packages?
- Web services technology may initially be more complex than traditional software to use. Even if you buy a package, you're likely to need some technical support.

#### Plan the roll-out phase

- Look at training implications what will the cost be?
- Decide which staff will require training and allow time for them to adjust to the new system.
- Keep your business partners informed and keep up-to-date on what they are doing. It's in everyone's interests to develop this new technology sensibly.
- Which of their systems will they enable with web services interfaces?
- What are their security requirements?
- Use existing network security technologies such as a Virtual Private Network (VPN), Public Key Infrastructure (PKI) and digital certificates to ensure exchanges with partners through web services remain secure.
- Get involved with web services security standards such as the XMLS specification.

**ACT****Implement the web services**

- At first, you may want to use third party web services to convert and exchange data from existing applications.
- Begin with in-house projects such as replacing manual processes that can be automated easily and integrating back office systems, giving staff the opportunity to get to grips with the technology.
- Be prepared for upheaval, especially if you have an in-house IT department that may be facing a steep learning curve.

**Develop at your own pace**

- Rollout any necessary training.
- Encourage staff involvement and feedback. This will help smooth implementation, as staff buy-in can make or break a technology project.
- Consider setting up a cross-departmental taskforce to manage the implementation process it will help with staff buy-in and ensure that implementation works company-wide.

**Evaluate**

- Monitor and review the impact on your business and against your objectives.
- Get feedback from staff, customers and suppliers on the changes.
- Evaluate the impact after 6 months and 1 year. Have you achieved your objectives? Establish how you could improve things further.

**FURTHER HELP AND ADVICE****General information**

<http://www.webservicesarchitect.com> articles and analysis on web services. -

<http://www.webservices.org> news-based site, with information about web services from all sections of the industry.

<http://www.searchwebservices.techtarget.com> another TechTarget site. This free resource for IT professionals provides web services news and resources such as white papers, tutorials, search engines and live events with representatives from industry.

**Security**

<http://www.xwss.org/index.jsp> the XML Web Services Security Forum is a resource, newsgroup and newsletter dedicated to security issues related to XML web services.  
<http://www.microsoft.com/frontpage/evaluation/default.htm> a guide to Microsoft's web page creation program that also supports intranets.

**White papers**

<http://www.w3.org/TR/wsdl> an informative white paper on Web Services Description Language (WSDL).

**Web Services Providers**

Developers work on platforms or 'frameworks' supplied by the larger software companies such as Sun Microsystems, IBM or the Microsoft Corporation.

**GENERAL BUSINESS ADVICE**

For more information on achieving best practice in your business contact your local Business Link advisor by visiting the website at <http://www.businesslink.gov.uk> or calling 0845 600 9 006.

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