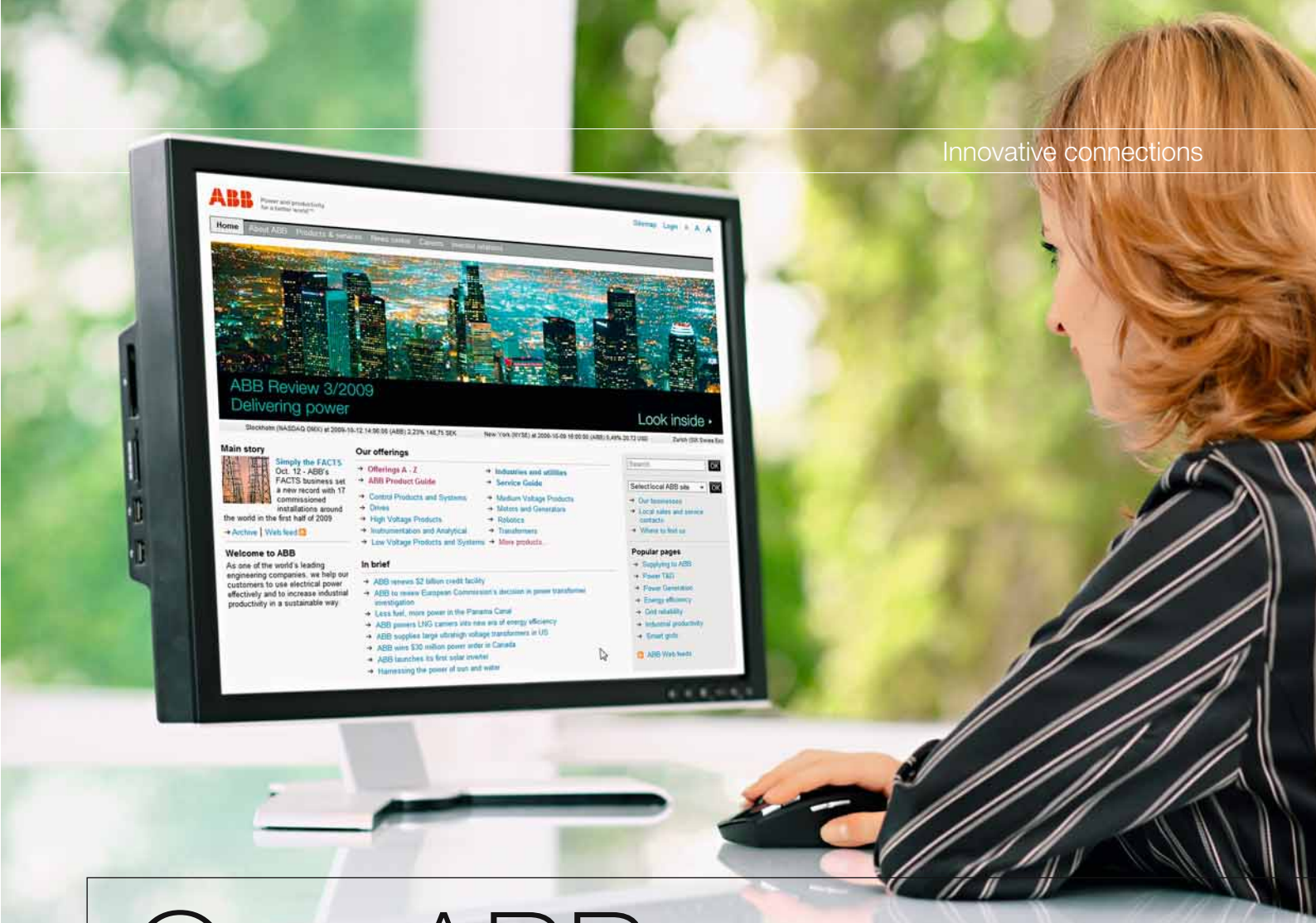


One ABB on the Web

Increasing the quality of customer services is what this platform does best

Jan Anders Solvik, Håkan Wärdell, Nathan Becker

As far as most of us are concerned, the Internet has become a valuable source of information. For potential customers it's where they research products and services, look for answers and get hold of documentation. Existing customers use the Web to track orders, look for training courses, keep up with industry trends and find product documentation, while employees can easily access relevant and up-to-date information. A Web site is without doubt the best and most environmentally friendly advertising brochure a company can utilize.

Accessibility and usability are two very important criteria that existing and prospective customers, partners and employees are looking for in today's fast-paced world. They want to find the right information quickly and easily, irrespective of location or the number of back-end applications or services that are used. In other words, the content of a Web site should be tailored to satisfy local needs and deliver local marketing messages while at the same time it should exhibit a common global look and feel.

This is something ABB has accomplished. Through its One ABB on the Web platform, the group is able to serve a global audience through a single access point, www.abb.com.

How can a company facilitate closer collaboration with its existing customers, continue to attract new customers, and at the same time address the needs of its partners and employees? Servicing these specific target groups with a common look and feel is not an easy task. When an online visitor accesses a particular Web site, they expect to find a range of information about products, services and solutions related to their industry and country, and preferably in their local language. In many cases what the visitor actually discovers is something quite different: Often they are faced with having to remember different URLs, work in different interfaces, and manage different usernames and passwords for the various applications they wish to use. As time is a very precious resource, this visitor will probably abandon their search and move from being a potential customer to becoming a competitor's customer.

Accessibility and usability of a Web site are two very important criteria that people are looking for in today's fast-paced world.

Five years ago, this was the story ABB was hearing from its customers, and in response the group decided to revamp its Web offering to meet their demands. Today, abb.com presents the ABB Group's wide range of products and services in a consistent fashion. Building on a single platform known as One ABB on the Web, abb.com is both a global and local source of information for different user groups through a single point of entry. ABB's Web platform is built on a flexible architecture that enables new services with a consistent and standardized look and feel to be easily connected. More importantly, by maintaining information about its complete portfolio in one common solution, ABB is able to serve customized information to everyone. Users are able to find information about ABB products, services and solutions related to their industry and country. In addition, the use of a standardized Web interface and common interaction elements help bring about an awareness of applications and services that were unknown to many.

For secure information, the One ABB platform offers the single sign-on (SSO) mechanism for authentication and authorization services. Now users can access their ABB Web applications and services with the same username and password.

Guiding the customer

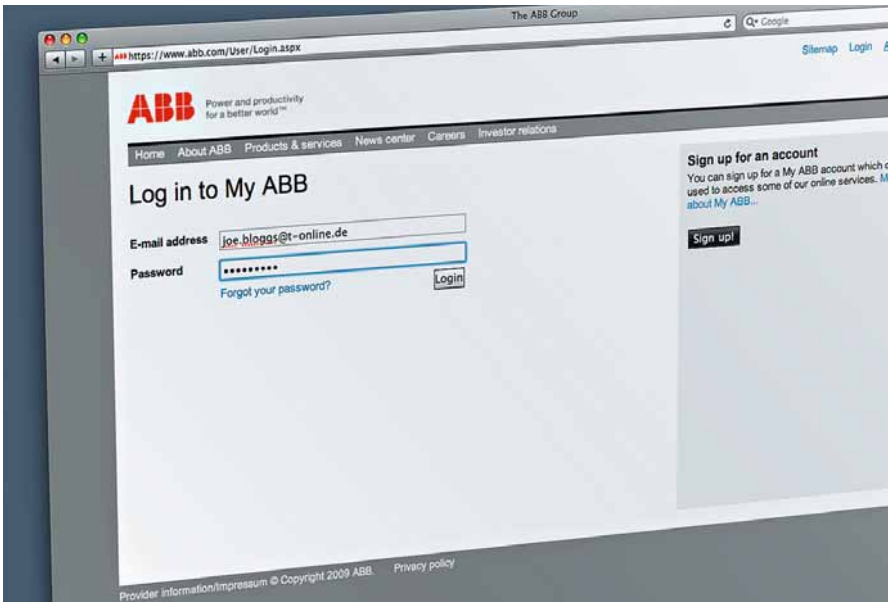
The One ABB platform offers a range of customer services, such as training-course locators, extranets for its partners, direct access to installed ABB equipment and the possibility of ordering products, spare parts and maintenance packages. All of the features are maintained using different back-end applications and services. The One ABB platform allows these different services to disseminate information while adhering to a common look and feel. The advantage of having a standardized Web interface and a common interaction element is that it speeds up the learning process for those using the services for the first time. The requested information is collected and made available via the My ABB portal, which customers can access directly on www.abb.com.

ABB's One ABB on the Web platform is built on a flexible architecture that enables new services with a standardized look and feel to be easily connected.

Localization of abb.com

As is the case with many international companies, ABB maintains a local presence in many countries so that it can better understand and respond to customer needs. This local presence also extends to the abb.com Web site. The capabilities of One ABB on the Web enable:

- The translation of products, solutions and services: Because a majority of users prefer to read the content in their native language, translating the portfolio will provide a better user experience for customers.
- The addition of local products: A local unit can add products made to support local standards. These products are generally not available in other countries and regions.
- The exclusion of non-relevant products: Products that do not conform to local standards or that are not relevant to a particular market can be excluded.
- The viewing of localized documents: In many cases documentation is only relevant to a specific country or countries. The One ABB platform supports the presentation



of these documents to visitors only if they are affiliated to the authorized countries.
- Local contacts: A central database supplies the customer with the name of a local contact based on his preferences.
- Localized page: By setting up a country-specific page, it is possible to highlight events and campaigns that are only available locally. This page will only be shown if the user has set this country as their preference.

Technical realization in a nutshell

For Web content delivery and integration with back-end systems, the One ABB on the Web platform is based on Microsoft's well-known ASP.NET[1] and corresponding technologies, such as SQL Server and Active Directory. Integration is focused on open interfaces, which are based on Simple Object Access Protocol (SOAP) and REpresentational State Transfer (REST) principles. Security is implemented using Web Services Security (WS-Security) and Security Assertion Markup Language (SAML). IBM's Lotus Domino is used to manage Web content, which is delivered to ASP.NET using Extensible Markup Language (XML).

With the One ABB platform customers can access installed ABB equipment and order products, spare parts and maintenance packages.

The two key methods for integrating an application with One ABB are ASP.NET control and Context Service Consumer. These simplify user management and customer access 1.

ASP.NET control (Web control)

ASP.NET utilizes a wide range of controls, which are effectively like a toolkit for Web designers, allowing them to provide increased functionality as well as an enhanced visual appearance in their applications. Two such controls, user and Web server, are used extensively by the One ABB platform. Web-server controls enhance both visual appearance and functionality, while user controls are created by the Web designer to provide the functionality missing in built-in ASP.NET Web-server controls.

For Web content delivery and integration with back-end systems, the One ABB platform is based on Microsoft's ASP.NET.

One or more ASP.NET Web controls[2] are developed and embedded in the One ABB portal pages 2. Typically, these controls should produce a lightweight user interface that can communicate with a back-end Web service, which contains the business logic for the application. The application provides a precompiled ASP.NET 2.0 user control that also runs on the One ABB portal.

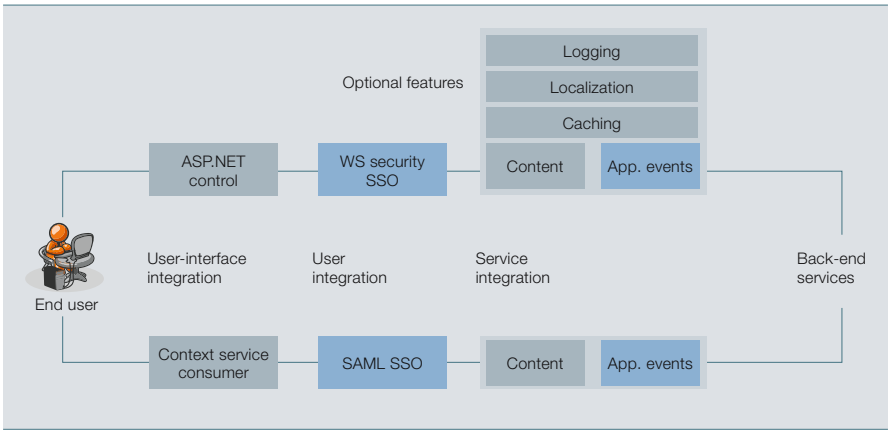
Context service consumer (Web service)

One ABB on the Web offers a Web service that provides an HTML context for the application. This approach is favored if the application has its own hosting environment and is not developed in the .NET environment.

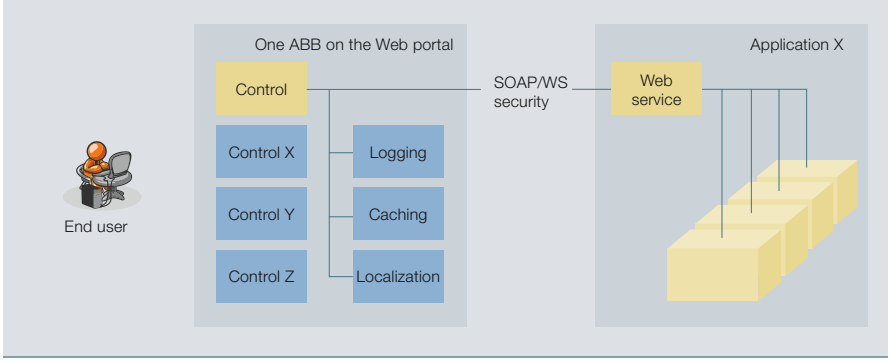
The application sends a request to the service to retrieve the appropriate html context 3. The html context generally contains:
- Style information (ie, style sheets and corresponding style elements)
- Top and left menus
- Other context information such as username and general common look-and-feel elements

The service currently provides the following contexts:
- MyABB (top and left menu, and log-in information)
- Product details (top menu, product hierarchy breadcrumb, language/country selector, product detail tabs)
- Language/country selector (together with a top menu)

1 Two key methods for integrating an application



2 ASP.NET control

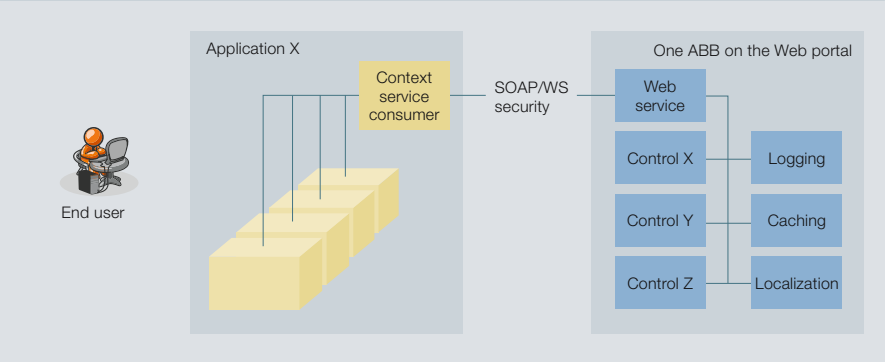


Footnotes

[1] Current version is 3.5.

[2] The controls are deployed with each major One ABB on the Web release.

3 Context service consumer



Single sign-on (SSO)

SSO ensures that all abb.com users, irrespective of whether they are employee, partner or customer, access their information and services with a single username and password Factbox 1. The advantages of implementing SSO also include:

- Forgotten passwords are managed on behalf of all services.
- All requirement concerning the security of username/password combinations are handled in one place and strictly follow the ABB security policy.
- Changes to user data are synchronized with all integrated services.
- There is one common process for managing user accounts.

However, managing users goes much further than just enabling a single log-in to several applications or services. With each user requiring authentication only once, the next logical step is to consolidate the service-specific authorization capability.

Common Authorization Management is fast becoming an important component as ABB transitions into a Service-Oriented Architecture.

Service-specific authorization is important in providing customers and users of ABB Web applications with the functionality and services they need. By managing user rights, roles and responsibilities in a common tool, ABB is able to tailor the functionality provided by several applications so that it can offer customized services to meet the needs of specific users and user groups. Additionally, by enabling ABB personnel (who manage users across different applications) to do this via one interface increases efficiency and improves data access security.

ABB's One ABB on the Web platform has enabled the many ABB businesses to streamline their information, quotation and ordering processes.

This common online tool is provided by a Common Authorization Management (CAM) software architecture. CAM is fast becoming an important component as ABB transitions into a Service-Oriented Architecture (SOA), and it will support the modularization of applications that will have the ability to exchange data with one another using data packages of interoperable services.

CAM architecture and design

CAM was built on existing functionality and experience coupled with future business-specific needs. As ABB continues to implement its One ABB on the Web group concept it is important that a common user authorization framework is used to quickly, efficiently and securely manage user access rights for the different applica-

Factbox 1 Single sign-on (SSO) user types

Self-registered

The user identity is not confirmed. The account was created over the Internet by registering on abb.com. Therefore the only valid attribute of such a user is the e-mail address.

Managed

The user, typically one who accesses business-specific services, has a confirmed identity with ABB. Security restrictions apply when user details need to be changed.

Internal (ABB employees)

Employees are integrated with ABB's Active Directory.

Factbox 2 ABB's Business Online application offers the following services:

- Online ordering capability 24/7
- A single interface to over 450,000 ABB products with supporting documentation and images (products and parts are country, region and channel dependent)
- Integration into ABB "configurators for custom products"
- Customized product catalogs
- Parametric product search capability and real-time stock availability
- Customer-specific pricing
- Request for a quotation
- A fully integrated quotation creation and approval process for fully configured, standard and local products
- Ability to convert quotations to orders
- Single-order entry and fully integrated order-change process
- Order routing to the different local ABB business units
- Real-time "chat" capability with ABB personnel
- Repair order processing
- Warranty order processing
- Emergency ordering
- Purchase order and credit card payment options
- Automatic e-mail notification
- Order status and history
- Fault and failure reports
- Real-time shipment traceability
- Extensive reporting

tions and services 4. In addition to groups, CAM introduces a flexible structure for creating attributes, which can be attached to any application based on its needs. The attributes can hold single or multiple values and be of any type. The CAM user interface has the same look and feel as abb.com, which must fulfill the same purpose.

Doing "Business Online" with ABB

Business Online is an example of one abb.com integrated application using both SSO and CAM. It was redesigned in 2008 in accordance with ABB's SOA strategy. The new architecture is based on Asynchronous JavaScript and XML (AJAX), which creates a dynamic and lightweight application. This technology introduces the concept of modularization, which drastically improves Web page performance while significantly reducing network traffic by limiting the amount of data that needs to be transferred.

Combining AJAX and dynamic HTML (DHTML) with server-side computing has added easy-to-use functionality. Some examples of this technology are

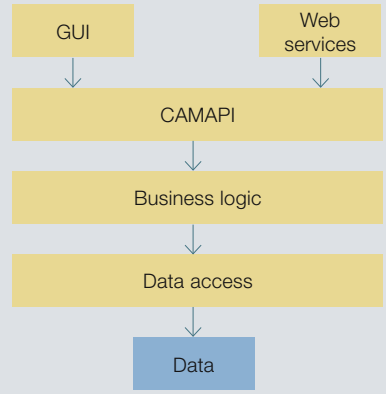
4 Common Authorization Management (CAM) architecture

Architecture
- Model layer: home made persistence API: easy migration to latest JPA
- GUI layer: struts
- Web services

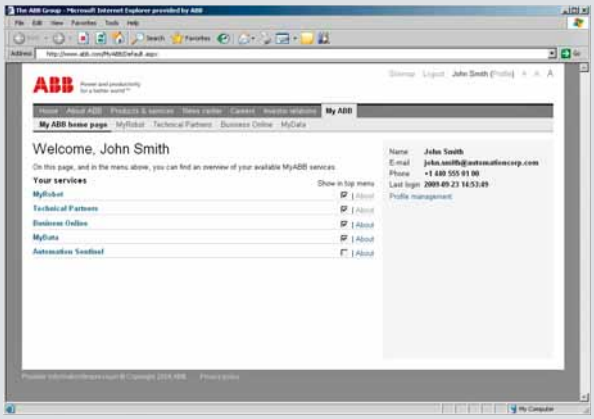
Environment
- Application server

Websphare with Java
- Database

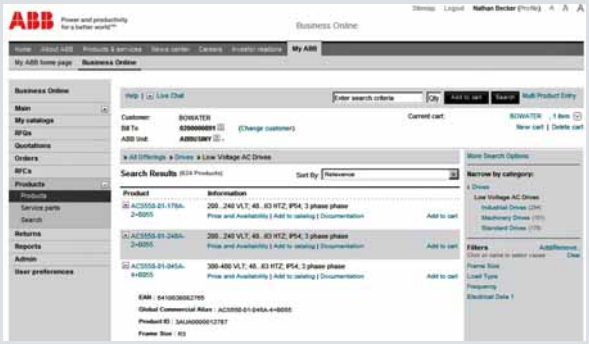
Oracle



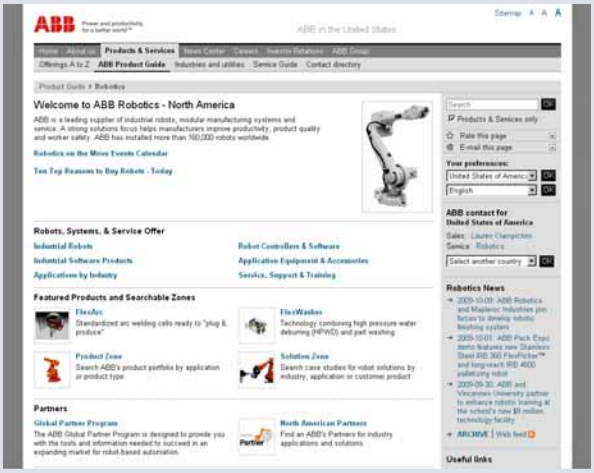
With a MyABB account customers can take control of the way they do business with ABB



Ordering online reduces manual work and minimizes mistakes



Localization of ABB: a country-specific page for North America



A typical country-specific page for Switzerland

evident throughout the ABB online ordering tool:

- Searching products: The product number automatically populates as the user enters an identifier, narrowing down the options with each typed character.
- Drag and drop: Products can be easily moved from search result pages to the shopping cart.
- Pricing and availability: Real-time Web services access back-end business systems.
- Images and documents: Real-time Web services access product image and document management systems.

Business Online is now fully integrated into the group Web site, enabling ABB to offer more consolidated online services to its customers Factbox 2.

Coming back for more

ABB's goal with its One ABB on the Web platform has been to increase the quality of its customer service by helping different user groups find the information they need in the fastest possible time. In addition it enables the many ABB businesses to streamline their information, quotation and ordering processes. Online business has been and will continue to be the way forward, so making it easy for the user is one way of ensuring they'll come back.

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Glossary

Active Directory
is a directory structure used on Microsoft Windows-based computers and servers to store information and data about networks and domains. It is primarily used for online information.
(Source: http://www.tech-faq.com)

AJAX
is short for Asynchronous JavaScript and XML, and is used when a designer wants his Web page to retrieve new information from the Web server asynchronously in the background without having to download a whole new page.
(Source: http://javascript.about.com)

ASP.NET
is a Web application framework developed and marketed by Microsoft to allow programmers to build dynamic Web sites, Web applications and Web services. ASP.NET is built on the Common Language Runtime (CLR), allowing programmers to write ASP.NET code using any supported .NET language.
(Source: Wikipedia)

Microsoft SQL Server
is a relational model database server produced by Microsoft. Its primary query languages are T-SQL and ANSI SQL.
(Source: Wikipedia)

REST
is an acronym standing for REpresentational State Transfer. Roy Fielding, who coined the phrase to describe an architecture style of networked systems, says that REST "is intended to evoke an image of how a well-designed Web application behaves: a network of Web pages (a virtual state-machine), where the user progresses through an application by selecting links (state transitions), resulting in the next page (representing the next state of the application) being transferred to the user and rendered for their use."
(Source: http://www.xfront.com)

SAML
stands for Security Assertion Markup Language and is an XML-based framework for communicating user authentication, entitlement, and attribute information. It has become the definitive standard underlying many Web Single Sign-On solutions in the enterprise identity management problem space.
(Source: http://xml.coverpages.org)

SOA
or Service-Oriented Architecture is essentially a collection of services that communicate with each other. The communication can involve either simple data passing or it could involve two or more services coordinating some activity.
(Source: http://www.service-architecture.com)

SOAP
or Simple Object Access Protocol is a protocol specification for exchanging structured information in the implementation of Web services in computer networks. It relies on Extensible Markup Language (XML) as its message format, and provides a way to communicate between applications running on different operating systems, with different technologies and programming languages.
(Source: Wikipedia)

WS-Security
or Web Services Security is a communications protocol providing a means for applying security to Web services. It describes how to attach signatures and encryption headers to SOAP messages as well as how to attach security tokens, including binary security tokens such as X.509 certificates and Kerberos (a computer network authentication protocol, which allows nodes communicating over a non-secure network to prove their identity to one another in a secure manner) tickets, to messages.
(Source: Wikipedia)

XML
(Extensible Markup Language) is a simple and very flexible text format derived from SGML (ISO 8879). Originally designed to meet the challenges of large-scale electronic publishing, XML is also playing an increasingly important role in the exchange of a wide variety of data on the Web and elsewhere.
(Source: http://www.w3.org/XML)