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Co-creating Value with SOA and Web Services

Linking business processes with web services leads to innovation.

Intro

Today's value network requires the interaction of processes between different organizations. These interactions make up an extended network of available services to create a loosely coupled mesh of suppliers that deliver value to customers. By communicating with customers and value chain partners across global resources, today's firm can provide the framework through which the customer co-creates (self-customizes) their own consumer experience.

The future looks different as the resources of many can now deliver value to the needs of one. New competitive advantage arises from the ability to convert raw materials, skills, and technology into customer-centric products. Access to labor, technology, and resources are no longer differentiators. In this configuration it's not necessary for firms to own the resources – just having access to the resources is enough.

For businesses to succeed in this changing environment, entrepreneurs will need to develop customized products from distributed resources. This will increase the need for advanced collaboration between businesses, suppliers, and customers. This collaboration requires levels of communication beyond the level of today's current software. Service Oriented Architecture (SOA) and Web Services have the potential to improve information flow in this process; allowing distinct systems along the value chain to communicate in a single ubiquitous language across a common connection method.

SOA and Web Services

Service-Oriented Architecture (SOA) promotes the idea that IT applications are service **providers** and **consumers** acting together to support the overall business goals of an organization. SOA defines a system in which a group of related software components with an autonomous nature carry out a given business process. These components can communicate with each other inside the same enterprise and with other services outside the enterprise. In theory SOA enhances reusability, flexibility, and reduces design time for projects. The idea has gained significance in recent years due to the emergence of new technologies based on open standards that allow different systems to communicate.

Web Services currently represent the best technology for implementing SOA. But not all web services are service-oriented. Typically a **service** is defined as exchanging and processing information. So there must be a **request** and **response** action involved in the web service for it to be considered an SOA component. Any web service that simply "pushes" information, like news or weather, is not by nature a component of SOA.

Web Services provide a necessary standards-based implementation that makes interoperability between value chain partners feasible. The tools that make this possible are **WSDL**, **SOAP**, **XML**, and **HTTP**. In general terms the HTTP provides the transport mechanism for this system to operate. While the WSDL defines the

requirements of the service during construction and the SOAP packages the XML messages that volley back and forth between the service provider and service consumer.

- **WSDL (Web Service Definition Language)**
WSDL provides a description of service for the interface contract.
- **SOAP (formerly: Simple Object Access Protocol – now it's not so simple – but still called SOAP)**
SOAP facilitates application-to-application interoperability between multiple processing points.
- **XML (Extensible Markup Language)**
XML is text based and can be read by virtually any machine on any platform.
- **HTTP (Hypertext Transfer Protocol)**
HTTP is commonly used by nearly all network and OS configurations.

Re-Usability

Designers should always consider whether the services they are building could add value to the organization beyond the scope of the individual project. If so, they should design the service for reuse by concentrating on getting the granularity right and by adopting corporate data models that enable process flow. Granularity refers to the level of abstraction in the process. If a process performs a very specific task; it is said to be of high granularity. If the process performs a general task; it is said to be of low granularity.

Flexibility

SOA implementations rely on a mesh of software services. Each service implements one action, such as filling out an online application for an account, or viewing an online bank-statement, or placing an online booking or airline ticket order. These services communicate with each other by passing data from one service to another, or by coordinating an activity between two or more services.

Services are offered at a business level of abstraction which renders the interface as a virtual handshake or contract. The contract is a mechanism that allows systems to be formalized. Currently SOA is providing well-defined contracts with which other systems or applications can interact and significantly decrease the dependency on coding. In this process, legacy and new applications are "wrapped" using the contracts, and they become a provider of services to heterogeneous systems on multiple operating systems across varied network architectures.. The process of wrapping the legacy application into a service allows for what is known as "loose coupling" of services. Literally "loose coupling" means everyone can talk to everyone regardless of network, computer, OS, or protocol.

Reduced Design Time

The purpose of SOA is to cost-effectively deliver solutions that generate business value. Service oriented architecture does this by promoting the use of flexible and sharable mini-applications. These miniature applications, can be pieced together to form a larger application or process. My research indicates that SOA delivers value through reduced coding, process sharing, and enhanced functionality. All of these characteristics can either lower development costs or increase the payoff from software development. We will examine the implementation of Web Based SOA to determine if these efficiencies can actually be realized.

SOA Example: Credit Application

To assess the business implications of SOA, we need to create an actual example of this technology in motion. For example, let's examine the use of SOA for a web based new customer credit application running on Microsoft Server – built using Microsoft Visual Studio and Dot Net technology. Credit applications are a very common business tool that is used frequently by millions of businesses to determine the credit worthiness of new customers.

A basic business credit application collects 3 categories of information:

Business Information

Information specific to your business: name, address, city, state, zip, federal ID number, phone numbers, websites, key contacts

Credit Information

Information about your deposits: business check, savings, and money market accounts.

Reference Information

Information about your references, which includes information about other companies that have done business with you.

If we would simply take a common application like the one shown to right and turn it into a web enabled form, then we would drop the resulting information into a database upon submission of the form.

This method is very common and standard. **But how can we make this credit application perform better?**

CREDIT APPLICATION FOR A BUSINESS ACCOUNT			
BUSINESS INFORMATION			
Title:			
Company name:			
Phone:	Fax:	E-mail:	
Registered company address:			
City:	State:	ZIP Code:	
Date business commenced:			
Sole proprietorship:	Partnership:	Corporation:	Other:
CREDIT INFORMATION			
Primary business address:			
City:	State:	ZIP Code:	
How long at current address?			
Telephone:	Fax:	E-mail:	
Bank name:			
Bank address:		Phone:	
City:	State:	ZIP Code:	
Type of account:	Account number		
Savings			
Checking			
Other			
REFERENCE INFORMATION			
Company name:			
Address:			
City:	State:	ZIP Code:	
Phone:	Fax:	E-mail:	
Type of account:			
Company name:			
Address:			
City:	State:	ZIP Code:	
Phone:	Fax:	E-mail:	
Type of account:			
Company name:			
Address:			
City:	State:	ZIP Code:	
Phone:	Fax:	E-mail:	
Type of account:			
AGREEMENT			
1. All invoices are to be paid 30 days from the date of the invoice.			
2. Claims arising from invoices must be made within seven working days.			
3. By submitting this application, you authorize Cortoso, Ltd. to make inquiries into the banking and business/trade references that you have supplied.			
SIGNATURES			
Title:		Title:	
Date:		Date:	

From my research of existing WSDLs available to business, I found eight potential web services that could be incorporated into our credit application to improve its performance. These services are: email verification, US address verification, SMS alerts and notifications, real time telephone verification, bank account verification, D&B business prospect credit report, and IP address location.

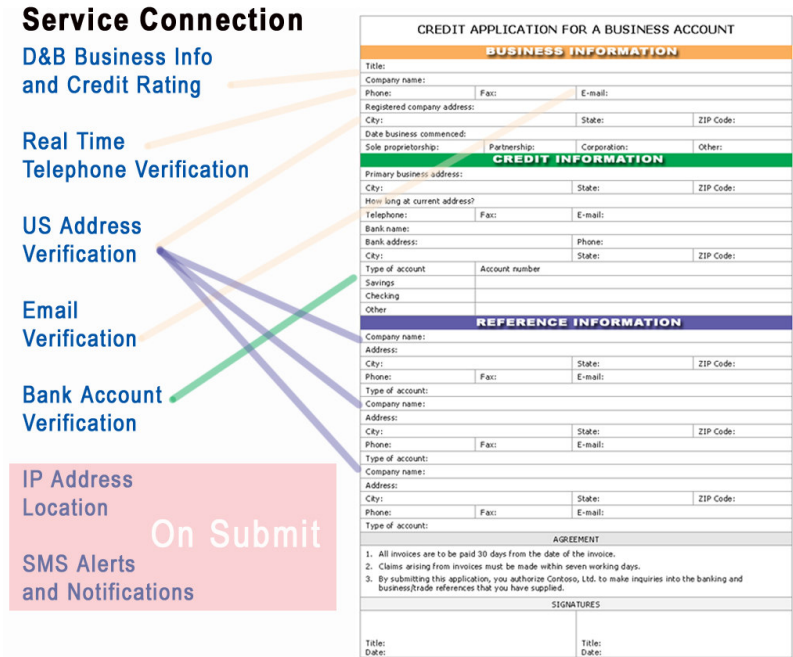
- Email Verification: Provide any email address and you'll receive an indicator response regarding its validity. Which means you'll be able to easily identify bad email addresses and non-existent domains.
- US Address Verification: Put the United States Postal Service to work for you. By using the USPS to verify, correct and enhance any address in the U.S. Corrects addresses, adds ZIP+4 data, provides delivery point verification, gives congressional districts, carrier routes and more.
- Real Time Telephone Verification: Checks the validity of phone numbers by calling the number automatically to confirm.
- Bank Account Verification: Checks the Bank name and account number to verify that a checking or savings account is legitimate and in good standing with the bank.
- SMS Alerts and Notifications: Make the most out of mobile phone messaging. SMS Alerts and Notifications instantly sends single or bulk SMS alerts and notifications to virtually any mobile phone.

- D&B Business Prospect: Get business credit information, including DUNS Number, Address, Telephone Number, CEO Name, Line of Business, SIC Code, Annual Sales, and Number of Employees.
- IP Address Location: IP2Proxy Proxy Detection Web Service allows instant detection of anonymous proxy by IP address.

By taking these eight elements and enhancing our basic data driven web application we will be providing the end user with information that is checked for legitimacy and also notifies the end user via mobile phone message when a credit application has been received.

Business Case

These eight Web Services could potentially lower processing costs for the end user. They can also insure that new customer accounts are complete and contain the best possible information.



All these factors will lead to establishing better credit risks for the firm, which improves payment speed and reduces the manual labor required to verify credit applications. Both of these effects are measurable on the income statement and can lead to a return on investment and improved performance for the firm.

With the use of SOA and Web Services, heterogeneous systems along the value chain can be linked together in a common management interface. Tolerances can be established that will warn partners down the supply chain before problems appear on the horizon. Order quantities can be checked in real time to ensure quick delivery of inventory. Credit references can be checked to reduce credit risk. And communication between disparate partners across varied networks can be combined into a single system to speed up delivery. All of this can occur with the use of Service Oriented Architecture and Web Services.

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