Written by Allen Brown

Boundaryless Information Flow

The expanding role of Web services

Web services fits into the operational model that The Open Group calls Boundaryless Information Flow – the secure, reliable, and timely flow of information throughout and between enterprises. At our recent conference, chief officers from enterprises that use Web services in their business, including the business of government, recounted the role of Web services in achieving Boundaryless Information Flow. The tales of successes and challenges from McGraw-Hill, MasterCard, and the federal government offered surprises, affirmed a few fears, and highlighted specific victories in the world of Web services.

McGraw-Hill

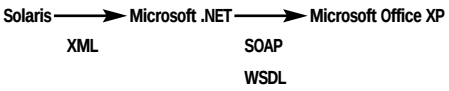
"McGraw-Hill is all about brands, people, and content," said Jim King, McGraw-Hill's chief information officer, as he introduced examples of how the company uses Web services to promote its brands, connect people, and deliver content. As a vertical information provider serving the top industries in the world – education, healthcare, finance, and construction – McGraw-Hill has gone beyond today's best practices in Web services and is now laying the foundation for the future of Web services. Let's look first at what they're doing today, and then push into the future.

The overarching objective of McGraw-Hill's Web services is achieving what King calls "content and context transparency." One of the first questions McGraw Hill's Web services team asks themselves is, "What is the user's context?". That is, what is the consumption method, or what is the context in which they need McGraw-Hill information? King emphasized that a media organization such as McGraw-Hill gains credibility based on editorial context – and context management can be a nightmare! The act of mapping context to content entails a keen understanding of the workflow of an industry and the people in it.

Transparency must be embedded in the flow of information and the flow of data. In the flow of information, content is delivered within a domain context, and integration into an application services context is transparent to the user. In the flow of data, content within a functional context is transparent to the processes that manipulate that data. The latter point is contingent on interoperability, which is the cornerstone of Boundaryless Information Flow. King discussed two specific use cases involving financial services and construction.

McGraw-Hill's business unit Standard & Poor's has built a set of about 60 Web services, which the company characterizes as encapsulations of content delivery to end-user devices and applications. The number makes sense in light of the comprehensive nature of S&P. The financial services include securities information and evaluations, ratings services, risk management and assessment tools, equity analysis, fund services, financial reporting, value consulting, and much more.

The S&P Web services rely heavily on an alliance with Sun Microsystems, but involve a mixture of technologies designed to use Smart Tags and Microsoft XP to deliver content directly to the customer's desktop:



King continued by noting that the complexity of Web services for the construction industry "is more indicative of why we need all this transparency." McGraw-Hill links facility owners and other key players with the project and certain products. The company currently represents more than 600,000 construction projects in the United States alone. And as he enumerated what types of content support them, King said that in paper form, "there are hundreds of pounds of information per project."

The workflow in the industry between the data and what people in the industry do with the data concurrently engages multiple applications, consumers of information, and products. At any given time, the people who need the data include the facility owner, lead architect, project engineer, general contractor, building part suppliers, facility manager, and service providers. The primary applications in play are financial, CADD, document management, project management, estimating, and scheduling. McGraw-Hill's (Sweets. com) products number about 61,000, including specifications, downloadable CAD libraries, streamlined contact with local manufacturers' reps, and much more.

As King noted, "Our

Author Bio

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industries are hugely complex. They are not transparent. They are not integrated. They are certainly not interoperable. But the winners among the vertical information providers – they are the companies that can get this workflow right and influence the providers of technology to help us map that technology and our content into this workflow."

In trying to create an architecture that serves that goal for its construction market, McGraw-Hill forged an alliance with Microsoft. King asserted that Microsoft's integrated approach seemed up to the task of achieving transparency in Web services for an industry with 1.2 million different businesses. He feels that, in this situation, Microsoft .NET keeps the customer focus on the content, and not how they got it.

King's explanation engendered interesting discussion in terms of The Open Group's vision of Boundaryless Information Flow. The Open Group has an unwavering commitment to work with suppliers, consortia, and standards bodies to develop consensus and facilitate interoperability – to evolve and integrate specifications and open-source technologies. Knowing this, King engaged the audience head-on in a discussion of proprietary Web services solutions versus others. This invariably led to one of the times when conference presentations "affirmed a few fears." In short, the industry needs more open standards that address the issues of security, reliability, and timeliness in the Web services world.

This is one reason why The Open Group took the unprecedented step of bringing together leaders of seven consortia to spotlight how they are contributing to the body of open standards for Web services and to ascertain areas of potential collaboration (see sidebar).

King also teased the audience with a glimpse of what McGraw-Hill sees as the future of Web services: Nanoservices. So as vendors contemplate ways of evolving Web services, they should keep in mind that at least one large customer is looking at extending Web services to communication with machines inside the body.

MasterCard

Simon Pugh, vice president of Standards & Infrastructure, MasterCard International, noted that e-commerce now represents 3 to 4% of MasterCard's business, and this is becoming an extremely important new channel. Inhibitors to buying on the Internet are the length of time involved and concerns about security and privacy. Addressing those issues will support MasterCard's e-business strategy to take credit card use into new areas in terms of both transaction size and type.

Standards are key to the solution. Pugh

Boundaryless Information Flow: The Role of Web Services

In a rare display of unified focus, leaders of seven major IT consortia came together at The Open Group's Web services conference in July. "Boundaryless Information Flow: The Role of Web Services" gave executives a chance to spotlight how their organizations contribute to the body of open standards for Web services and to ascertain areas of potential collaboration. A central message for many was the royalty-free nature of their specifications.

Allen Brown, president and CEO of The Open Group, described Boundaryless Information Flow, the framework for specific work areas of Web services, as something to be achieved through global interoperability in a secure, reliable, and timely manner. He outlined how the consortia present might work together to meet customer needs, such as those described by McGraw-Hill, MasterCard, and federal government executives at the conference, and grow the market for Web services. A fundamental element is using, not duplicating, each other's area of expertise. For example, The Open Group brings skills in business process scenarios, integration, certification, and testing.

Patrick Gannon, president and CEO of OASIS, covered his organization's main ebXML concepts in his address "The Building Blocks for eBusiness Web Services." He looked at business processes, business messages, trading partner agreements, and business service interfaces, all expressed in XML; Transport and Routing Layer, which moves the actual XML data between trading partners; and Registry/Repository, which provides a "container" for process models, vocabularies, and partner profiles.

Steve Bratt, COO of the World Wide Web Consortium, described the next steps of the W3C's groups with responsibilities to Web services. These include Architecture (completion of the architecture definition and use cases); XML Protocol (SOAP 1.2 to Recommendation, which should happen late 2002 or early 2003); and WSDL (issues found against WSDL 1.1, design a binding to SOAP version 1.2, and develop an RDF mapping).

Winston Bumpus, president, Distribution Management Task Force, noted that DMTF sees Web-Based Enterprise Management (WBEM) as the forefather of Web services and stressed the need to go beyond standardization in Web services. Active involvement in the implementation of standards is vital, with commitment to compliance testing and certification. In its work, DMTF emphasizes the importance of Web services infrastructure and the interdependence of its components, and the collaboration necessary to develop and promote compliance.

Richard Mark Soley, chairman and CEO, Object Management Group, focused on Model-Driven Architecture. MDA has UML, MOF (Meta-Object Facility), and CWM (Common Warehouse Metamodel) at its heart, using Web services, CORBA, Java, .NET, and XMI/XML to support a range of services.

Carl Reed, executive director of the OGC Specification Program, OpenGIS Consortium, described the work on the OGC Web Services 1.2 specification. This includes Sensor Web capabilities, Vector Data Feature production, Imagery production, and Common Architecture Enhancements. Web services for the mobile domain cover mobile-phone capabilities such as a navigation service find "nearest" service.

George Siegle, past chairman, OAG, provided insights on OAG's deliverables, namely, applications architecture, collaboration definitions in UML, XML messages defined in prose, XML messages expressed in XSD, data dictionary, and using industry standard frameworks to avoid duplication.

asserted his concern that the standards required to support Web services are not mature, particularly in the area of security. Other issues are a perceived lack of stability in the architectures, the need for vendor-neutral tools, and the costs of technology change.

MasterCard does, however, see expanding potential for the use of Web services in many areas, one of which is their ATM Locator, which enables customers to locate the nearest MasterCard ATM from a device such as a WAP phone or a PDA.

It is also working on a Secure Payment Application, an initiative for Internet transactions that provides a guaranteed payment to the merchant. The consumer is authenticated for the transaction by the issuer, and a token (UCAF – Universal Cardholder Authentication Field) is provided to the merchant, who then submits the populated UCAF to receive the payment guarantee. This application will be XML based and is addressed to the URL of the authentication mechanism of the customer's bank. As a final note, Pugh emphasized that with mobile transactions the situation becomes more complex, and MasterCard is looking to build an authentication Web service.

The Federal Government

In terms of the distance to travel to implement robust Web services, Mark Forman's territory is the largest described by any user presenting at the conference. The Bush Administration's associate director of information technology and e-government, Office of Management and Budget, began with the statement of a daunting IT-related goal: "We're trying to reform the federal government." Forman then carefully outlined how his organization intends to turn $53 billion in Fiscal Year 2003 IT expenditures into benefits for U.S. citizens. His view, expressed strongly in a presentation entitled "The Need for Web Services in the Federal Government," is that Web services comprise a big part of the future IT scheme for federal agencies.

A goal of the Bush Administration is to move the government from being agency centered to being citizen centered. Embedded in that goal, according to Forman, is the vision of "an order of magnitude improvement in the federal government's value to the citizen; with decisions in minutes or hours, not weeks or months." Forman describes the current ROI horror – the reason why big expenditures in technology still have not quickened the pace of decision-making: "We've triple invested and we're not leveraging the business practices." He raised eyebrows by admitting that government agencies have often spent substantial funds to shut down functionalities in the technology they have procured. It has sometimes reflected a conscious avoidance of business practices.

Forman defined e-government as "the use of digital technologies to transform government operations in order to im-

prove effectiveness, efficiency, and service delivery." The aim is not just one of making information available via the Internet – there are thousands of federal Web sites and the government is heavily dependent upon electronic connectivity. The task is essentially one of enterprise resource management. The problem is illustrated by the way in which departments approach it: each does its own, but in fact no one was looking at the total enterprise. At the core of Forman's approach to solving the problem is "simplify and unify."

In essence, "simplify" means adopting simple business practices. At the moment, if a company of any size needs to do business with the federal government, it needs to hire a lawyer or an accountant to navigate the complexities of the system.

"Unify" is just as straightforward. Different arms of the federal government have gathered vast quantities of information that they have not shared with each other, primarily because they had no efficient mechanism to do so. As a consequence, organizations and individuals have been burdened with submitting the same information many times. An inherent part of the solution is that the government, like any business, has to focus on key customer segments – citizens, businesses, intergovernmental contacts, and government employees. To quantify the problem, U.S. businesses alone spend 7.7 billion staff hours a year sending information to the government!

Key technology trends that the federal government is tracking to support the "simplify and unify" strategy are, among others, increasing broadband content and transactional interoperability among government, industry, and individuals; and identifying commodity transaction components that facilitate increasingly agile integration. A central trend Forman hit on was "looking for Web services to become business services."

The federal government defines Web services as Web-accessible automated transactions that are integrated into one or more business processes. They have two main attributes. First, Web services allow the government to build business functionality. Second, they are generally invoked through Web service interfaces, clearly leveraging open standards. A Web service, said Forman, is not a complete solution but a component that contributes to the construction of a solution.

He cited two key opportunities that arise through the use of Web services: accelerating cycle time and enterprise modernization. If Web services can be coupled and scaled in a realistic manner, the federal government will take a giant step toward achieving the Bush Administration's stated goal.

PULL QUOTE

Forman also identified what sort of Web services opportunities exist right now:

- ***Services to citizens:*** Many require hooking up with basic GIS information
  –Disaster management: Location of assets, predictive modeling results, and availability of hospital beds
- ***Support delivery of services***
  –Strategic planning: Access to capability, decision support, data availability, and analysis
- ***Internal operations and infrastructure***
  –Financial management: Debt collection, payment processing, collection, and reporting

He saw the following fundamentals for success in applying Web services:

- Identify common functions, interdependencies, and interrelationships, and evaluate barriers to information sharing.
- Implement Web services in a way that addresses both the opportunities and risks of a "networked" environment; security becomes a key element.
- Leverage technologies to achieve benefits of interoperability while protecting societal values of privacy, civil liberties, and intellectual property rights, among other things.

In conclusion, Forman turned to the burning question of how to leverage Web services quickly, and then highlighted the following issues that need to be resolved:

- Should we have our own UDDI server in the federal government? Who should own a UDDI server and enlist WSDL?
- What shared Web-accessible transaction components are available from whom (e.g., search, PKI-related services, patching services)?
- Which agency has a business model and can write the business case?
- Are Web services supply or demand driven, that is, provided when there is enough demand, or ahead of demand in order to achieve changes?

The Open Group Point of View

Web services play a central role in fulfilling the mission of Boundaryless Information Flow, so the same fundamental elements must be present in both – security, timeliness, and reliability. Whether we're talking about enterprises like McGraw-Hill and MasterCard or the agencies of the federal government, none of these objectives will be realized in a customer-centric way without collaboration between buyers and suppliers.

The sense of urgency that energizes that collaboration – that makes things happen at Internet speed – comes from committing to the vision. In short, we achieve Boundaryless Information Flow in our information infrastructures when all parties involved have action plans and timelines to achieve it. Ultimately, it comes down to a matter of choice. Do you want to be one of those people who changes and revolutionizes the way business is done? The Open Group does and hopes others will, too.