



Adapting to Web-based Environments with GMC PrintNet Connect Web Services

A GMC Software Technology White Paper

Table of Contents

SOA and Web Services Transform Enterprise Processes	2
Maximize Standards-based Computing Advantages	2
Web Services Business Benefits	2
Characteristics of Good Web Services	3
Meeting Needs in Production and Service Environments	4
<i>Web Services in the Enterprise</i>	4
<i>Web Services in Commercial Enterprises</i>	4
The PrintNet Connect Web Services Solution	5
<i>The Approach to Web Services</i>	6
<i>An Overview of the WWW-based Production Process</i>	6
Deploying Web Services Successfully	7
<i>Stakeholder Involvement</i>	7
Comprehensive Capabilities for All Levels of Users	8
User Empowerment	8
Internal User and Customer Benefits	8

SOA and Web Services Transform Enterprise Processes

The move to Service Oriented Architecture (SOA) and Web Services is having a dramatic impact on corporate enterprise computing. Web Services and SOA are rapidly establishing themselves as standards that are in the forefront among new technologies that promise to transform the processes that drive enterprises.

Web Services bring together business and technology at the point of need. Together with SOA, they deliver functionality that can be used and reused regardless of how services are implemented. By accessing applications and business logic using standard Internet protocols, organizations are now able to maximize their existing infrastructures and processes more efficiently and more productively than in the past. The potential impact on workflow and productivity is significant.

Maximize Standards-based Computing Advantages

As Web Services and SOA are gaining momentum, businesses are implementing Web Service strategies to ensure that they maximize the benefits of standards-based enterprise computing. Large financial services companies, telecoms, government and retail organizations are among the early adopters of SOA and Web Services. However, the technologies can benefit small and mid-sized businesses as well.

A Web Services strategy addresses the need of companies to adapt functions for increasingly Web-based environments. It provides a platform that helps integrate existing applications into SOA automation processes. When Web Service applications are applied to processes such as high-volume document production workflow, organizations can respond more quickly to business and market changes.

Implementing a Web Services strategy can open the door to new revenue opportunities and provide value-added capabilities such as Web-based workflow. Web Services facilitate better sharing of information and communication for customers, internal project participants and suppliers. The results include more productive business relationships, better process management and more efficient organizational alignment.

Web Services Business Benefits

Web Services applications are designed to be dynamic and reconfigurable to meet the needs of a fast-moving business environment. SOA is based on a distributed computing environment that encompasses Web Services. Web Services are self-contained functions built on standards that work together without the need for extensive customer coding.

Web Services bring together business and technology at the point of need. Companies that successfully implement Web Services and an SOA can expect to experience a number of benefits, including:

- Faster response to changing business needs
- More effective leveraging of IT assets and improved planning for IT expenditures
- The ability to quantify ROI and prove the value of investments and projects
- Reduced risk by implementing projects in small segments rather than all at once
- More control over processes such as change authorizations and product releases
- A framework that supports integrating multiple products into the architecture
- Easier training, better business controls and improved IS, audit and control facilities

Web Services improve organizational alignment by providing consistency through template-based interfaces and controlled automated processes. Template-based requests ensure consistent use of standards and common practices while standards-based interfacing eliminates communication problems arising from incompatible systems. The net result is faster processing of work requests and more efficiency overall.

Characteristics of Good Web Services

Web Services have the potential to change the way business is conducted. Good Web Services share several characteristics:

Built on open standards

Web Services are built on open standards so they can connect seamlessly without custom programming, even if different elements don't use the same language or run on the same platform. This approach makes it easier to maintain alignment with communications throughout a corporation or commercial entity.

The standards-based approach enables distributed computing, which is the backbone of SOA. It broadens access and use of applications to customers, partners, remote offices, employees, and departments. Web Services puts any application that can work in a Web environment into the hands of the users who need it, regardless of their level of programming experience.

Employ comprehensive, standards-compliant interfacing

Typical IT environments involve so many processes and transactions that making just one change can bring down everything in proprietary systems. This is no longer the case when communications are centralized around the Web Services standard.

Standards-based interfacing eliminates the need for custom coding, even between proprietary components. Standalone, proprietary applications don't naturally interface with other enterprise systems. Without standards, communication requires extensive effort to develop and deploy.

With Web Services standards in place, protocols such as the Simple Object Access Protocol (SOAP) can make a change without impacting the function of other Web Services or the overall system architecture. SOAP interfacing simplifies combining previously incompatible architectures or applications when companies merge or acquire other companies. IT resources are freed to perform more critical tasks since there is no longer the need to spend hours stripping out an application or reprogramming an entire process. Projects such as modifying a customer letter for use in a branch office can be completed without rewriting the application or involving people beyond branch personnel directly involved in producing the letter. Production in a service bureau can be streamlined for maximum efficiency even when there is a mix of large and small customers and jobs.

Automate processes

Automation can seamlessly reroute work and jobs, with function consistently driven by established business rules. This eliminates poor utilization of resources.

Processes occur automatically without manual intervention. Cycle times are reduced because jobs go to the resource that can do the work fastest. Automating process also contributes to more efficiency and speed in responding to customer service requests.

Simplify integration and repurposing

The reliance on standards and common practices allows Web Services to be revised easily, repurposed and reused for other business functions. Changes do not require that underlying code be rewritten every time changes are made or new capabilities are added to an application. Companies save time and money and eliminate redundancies. Strategies can start small and expand over time. Organizational alignment can be enhanced across a consistent interface and set of practices.

Offer ease of deployment and maintenance

The standard, reusable components of Web Services applications simplify development, maintenance and integration of applications. Costs of infrastructure and personnel are reduced, while productivity improves, since it takes less effort to maintain and manage IT environments. There are fewer issues with changes or additions, because IT is not recreating software each time, but is using previously tested, proven applications instead.

Ensure security and control.

Document processes are managed via templates and business rules. This leads to more control, more secure environments and more consistent process management. Employees, suppliers and customers only see the data and tasks for which they have authorization. Administrative or security changes take place immediately and consistently across the environment.

Meeting Needs in Production and Service Environments

Web Services are meeting the needs of both corporate enterprises and commercial operations. Enterprises and commercial operations have different needs and derive different benefits from the use of Web Services.

Web Services in the Enterprise

Enterprise users typically include marketing, operations and IT as well as external clients of the business, with the majority of users in house. Workflow is production oriented. Users in these environments are not creating many applications, since these are determined and made available at the enterprise level. Work is driven from one central application and enterprise users have no need to know what platform or application is behind it. However, to perform their jobs, they need control over when, where and how work is produced.

Web Services make it possible for users to have that kind of control. For example, a customer service representative in a financial institution can sign up a new mortgage customer and immediately start the automated workflow to create a welcome kit that is integrated with other communications the new customer will receive. Instead of a series of one-off jobs, the company can now combine multiple requests downstream and produce them more efficiently as a batch. This greatly speeds the process of delivering information to the customer and contributes to lower costs.

Web Services in Commercial Operations

Commercial operations, service bureaus for example, also have internal clients, but much of the work they do involves providing services to external users – their customers. Web Services make it possible for service bureaus to offer more convenience and value to their existing customers and attract new customers. These commercial operations can develop tools such as direct mail or letter templates and use Web Services to make these tools available for their customers to use to create their own materials.

With Web Services, service bureaus can expand their market to accounts such as small businesses that it would not have been economically feasible to serve previously. Handling these customers via a template driven Web page provides commercial operations with a new revenue stream that doesn't drain margins. Small jobs can be commingled for better postal rates and the service bureau does not tie up staff with smaller, less profitable jobs. To the service bureau's production staff, commingled jobs still look like large runs, and do not require additional resources or special handling.

The PrintNet Connect Web Services Solution

PrintNet Connect Web Services, in conjunction with GMC PrintNet-T document customization software, provide a standards-based platform for integrating existing applications into SOA automation processes. PrintNet Connect fits all the requirements of a scalable document production system and offers several advantages. For example, PrintNet Connect:

- Uses on-line communications based on XML-enabled network load balancing, speed and availability. XML-enabled communications benefit enterprises that have invested in building an effective IT infrastructure but need to be able to communicate between legacy components and Web-enabled applications. XML ensures communication consistency and easier integration into the company's overall Web-based architecture.
- Makes it possible for organizations managing myriad documents, records and other information maintained across disparate platforms and systems to bring them all into the production process regardless of their source.
- Gives access to all the workflow related to running production, which in turn can be the starting point of other applications useful to others in the company, such as CSR support or online presentment.

PrintNet Connect Web Services provide a powerful, fully integrated solution for seamless application integration. PrintNet Connect Web Services work in concert with the PrintNet T platform to drive multiple applications from a single platform. Unlike other solutions that may require the use of multiple tools to accomplish tasks such as Web presentment of statements, the PrintNet T platform encompasses all of the tools to compose and drive production of both printed and electronic statements.

Even in a template-run scenario, many competitive solutions require more than a little manual intervention and integration to operate correctly. The Web portion of these applications often runs a different production engine from the printed version, making it essentially two applications requiring significant translation work before it will perform both functions. While other products that can run production on the Web portion of their Web Services solution do exist, the platforms behind these products are far less powerful than the PrintNet Connect Web Services platform and cannot provide the level of service available with PrintNet Connect.

Some products offered for Web-based workflow lack the power to do statement processing. Their inability to handle that kind of data creates problems for organizations that need to personalize high-volume communication. In contrast, PrintNet Connect offers users the full power of PrintNet T for their applications but still has the ability to throttle back so that even lower-volume users can take advantage of its capabilities.

The Approach to Web Services

The PrintNet Connect Web Services suite is a collection of APIs that connect with both Web servers and applications. PrintNet Connect users have total access to PrintNet functionality enabled through remote calling of the PrintNet T server, which in turn activates any number of actions and processes related to document production. Communication is defined in terms of XML request/response messages. XML messages can be received through a SOAP protocol via http request or via IBM WebSphere Message One.

The primary function of the PrintNet T Server is running jobs and spool file production. The Web service client defines the job run. Adding PrintNet Connect Web Services makes it possible for users to access PrintNet T to:

- Load jobs
- Run jobs asynchronously or synchronously
- Store output, data and files in the PrintNet T WFD workflow format
- Convert images
- Convert WFD files to XML

PrintNet T interfaces with customer applications in several ways:

- SOAP to Web Server
- SOAP to customer Web pages using PrintNet T Web controls
- IBM WebSphere message queuing
- Windows message queuing
- Hot folders

An Overview of the WWW-based Production Process

The user interface, a Web page created in front of PrintNet T, for example, allows several ways to put data into a production process on the server. Resource data are defined, as are page elements. Workflow is scripted. Resources such as variable data files are uploaded to the server database, which is also based on a plug-in approach as a separate library. This is the base setup for job production. Web Services can use resources directly from the file system that stores them.

The Web Services client defines how the spool file will be prepared. It might be called as the source of PDF pages for proofing or as a gigabyte spool file for production. The client can define a synchronous or asynchronous process with immediate response. Continuous connection between client and server is not necessary for the workflow processing to proceed, a significant advantage with huge files that can take a long time to spool.

Since Web Services communication is based on a request/response structure, the response for job running includes:

- The spool file or reference to it
- A log file from spooling
- A collection of error messages including error code, time of occurrence and description, if needed

The spool file is returned in the response message as an XML message download. The spool file can be downloaded later to another location. As a security and housekeeping measure, after a predetermined expiration period, an uploaded spool file or database is deleted from the server. This is especially important when the spool file contains confidential customer information such as financial account data.

PrintNet Connect-enabled workflow eliminates addresses a variety of communication challenges such as:

- Increases customer response and fulfillment
- Eliminates operational bottlenecks
- Lowers the cost of application development
- Reduces the time and cost to make changes
- Reduces the cost to support/maintain the system
- Provides high output quality
- Eliminates software and hardware limitations

Deploying Web Services Successfully

Web Services do not operate in a vacuum. A number of professional services such as application development and building Web pages surround them. A key consideration in selecting a Web Services provider is the provider's experience with these services as well as with Web Services.

Initial deployment of Web Services is usually the responsibility of IT. Once Web Services are integrated into the enterprise or commercial environment, Web Services users can be non-technical and can be in virtually any part of the organization. The purpose of Web Services is to remove the day-to-day burden from IT and shift it to end-users. PrintNet Connect meets this requirement, with tools for building pages and the capability to set up Web Control for even the most non-technical users.

Based on the specific needs of the business, IT can establish Web page interfaces for operations, production, marketing, compliance or other users. For example, if a bank statement requires updates of monthly messaging, marketing can have a Web page that allows non-technical users to accomplish the update without the need for IT assistance to make the changes. Or, an insurance enterprise that must combine information to create a personalized package for each of its customers can simplify the procedure by taking advantage of PrintNet Connect capabilities to bring data from different sources into the production process.

Stakeholder Involvement

Many areas of an enterprise or service bureau can benefit from automation, and achieve cumulative advantages in time saved and costs avoided. Therefore, Web services development is best served by input from cross-functional teams made up of marketing, IT, operations, documents, Customer service, compliance and others. The team can identify when and where benefits cross departments and impact the business results. For example, the same web service that enables automated scheduling and routing of mortgage printing can also help a CSR prepare and request new customer welcome kits faster and more easily.

Comprehensive Capabilities for All Levels of Users

The ability to operate in the interactive, push/pull Web Services structure is important at both the enterprise and individual user level. If a user request is an action that is defined in the PrintNet Connect environment, there is a fully defined response available.

With PrintNet Connect, a typical user has the ability to perform a subset of PrintNet T functions from a Web page. From the user perspective, all that happens is that they make a request and receive the answer or result of their query. The behind-the-process functionality of PrintNet T is transparent to the user. It drives the process but users don't need to understand how. All they need is access to a browser. For that matter, PrintNet experience isn't a requirement even for IT personnel.

This customer service example illustrates the simplicity of the process in practice:

- Web Services are hooked into customer service through Web pages
- A customer service representative receives an order
- The CSR hits a button to create a welcome kit that contains a variety of materials, all personalized for the specific customer and situation
- Web services takes over and communicates the request to the production server, where all the steps and resources have been defined
- The kit is created quickly and accurately
- The materials for the kit are automatically routed for production on the best available resource or batched with other jobs.
- Costs and time to complete the kit are reduced

All of this happens without any direct involvement of the CSR, IT or production staff. The technology is transparent to the user, who may not even be aware that the PrintNet T server is behind the document production process.

User Empowerment

Through PrintNet Connect Web services, enterprise users are able to do what PrintNet T can do, including such things as previewing a PDF or HTML file. When PrintNet Connect is integrated into a production environment, users have the ability to generate everything they need without having to call on IT resources to do so. PrintNet Connect can be set up to define the workflow to perform functions such as automatically sending a proof to the user. PrintNet Connect also can balance loads automatically to ensure that jobs submitted are sent to the best available resource.

Internal User and Customer Benefits

PrintNet Connect Web Services help both internal users and customers take advantage of the convenience of Web-based communication. Users are able to communicate with PrintNet T through established distributed Web-based interfacing. Branch offices and agents have easy, immediate access to document generation and production tools and that leads to greater efficiency and better customer services. Since the PrintNet application is transparent to the users, does not require any special skills and can be accessed via a Web browser, its capabilities can be extended to all levels of users in geographically dispersed locations.

Web Services such as PrintNet Connect help enterprises and commercial service use their existing infrastructure and processes in more efficient, more productive ways and provide an attractive alternative to manual operations. In addition to the advantage of being available to users with minimal computer skills, it offers features such as templates and automated processes that improve consistency while still giving users flexibility to do their jobs.

Web Services are an emerging technology that enables companies to achieve higher efficiency through process automation, job consolidation and better asset utilization. PrintNet Connect Web Services enable a robust Web-based document production system that can open the door to new opportunities for improved communication and better, faster, more cost-effective production processes.

About GMC Software AG

GMC Software AG is the leading global provider of open standards document design, composition and production solutions for the service bureau, commercial print, financial, insurance, utility and telecom industries. The GMC software solutions include PrintNet T for customized promotional, transaction and on-demand document design and production; PrintNet PA for business process automation; WebDesign and WebProof web tools for document design, approval and proofing; and PrintNet Connect for integration and support of enterprise applications and J2EE web services environments. PrintNet software features ease of use and implementation, platform and printer independence, and multichannel output support. GMC Software AG is headquartered in Switzerland with offices in Europe, the US, Canada, Latin America and Asia. The GMC group of companies is ISO 9001:2000 certified. For more information about GMC, please visit www.gmc.net.

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