Metastorm e-Work & XML Web Services

A Metastorm White Paper

Table of Contents

Executive Summary

The rise of Web Services represents a significant paradigm shift in enterprise computing. Because of its open XML-based nature, e-Work is an ideal tool to orchestrate and produce Web Services.

This white paper describes how e-Work can act as both a consumer of Web Services and a provider of Web Services. It can seamlessly use Web Services as if they were e-Work functions. Corporate developers can extend e-Work to make Web Services available to e-Work process designers so that they in turn can quickly and easily build processes that let users take advantage of Web Services. This is illustrated with an application that allows the user to query the progress of a package shipped by Federal Express using the FedEx Tracker Web Service.

This paper also describes a Web Services administration procedure that allows any e-Work action or stage to be provided as a Web Service.

XML Web Services opens e-Work up to a much wider range of applications; those that involve interactive integration with other web based applications. With the advent of XML Web Services, e-Work can be used for this class of applications while maintaining its advantageous ROI over other Business Process Management offerings.

Introduction

Among the defining characteristics of Business Process Management (BPM) technology is its ability to tie together other applications. To effectively achieve business process improvements that are integrated into your existing corporate environment, a BPM product must offer a number of different methods for integration that enable you to employ the most appropriate skill sets for a particular integration task.

The rise of Web Services and the array of associated standards has changed the way that organizations view the integration of business applications as well as providing a new challenge of how Web Services will be orchestrated.

Along with Metastorm, many of the other major application vendors including PeopleSoft, Siebel and SAP have already delivered systems that can communicate via Web Services.

This paper discusses how e-Work processes can be both a consumer of XML Web Services and how those processes can be exposed as Web Services that are consumed by other applications. XML Web

Services allows an e-Work process to interactively query another application on the Web that has been enabled for Web Services. Similarly, because of the product's XML foundations, e-Work processes can be exposed as Web Services and invoked from applications or toolkits such as .NET and the IBM Web Services Development Toolkit.

e-Work has an open XML-based architecture. It is this architecture and the natural fit between e-Work and Web Services that makes Metastorm e-Work the ideal tool to produce and orchestrate Web Services within business processes.

Metastorm e-Work Overview

Metastorm e-Work is the BPM platform of choice for over 700 organizations worldwide that are automating people-intensive administrative and management processes.

BPM solutions improve efficiency and competitiveness by weaving together people, data and enterprise applications into responsive processes where every decision is made on time and with the benefit of the latest information – every time. Taking advantage of XML Web Services further enhances e-Work's ability to provide responsive processes using the latest available technology in a practical application.

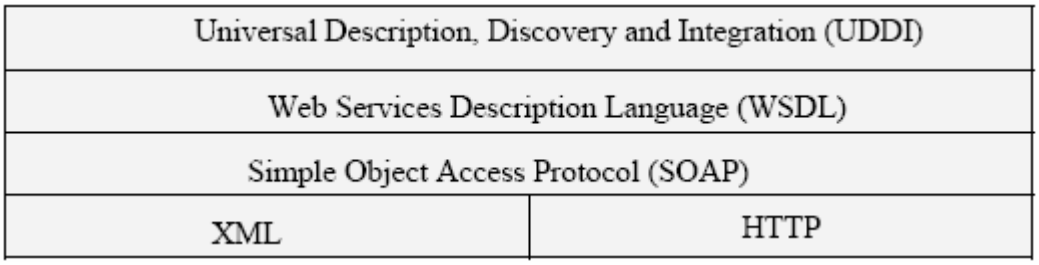
By ensuring compliance with performance and quality standards while eliminating the repetition and inefficiency associated with existing systems, BPM platforms allow managers and staff to focus on making informed decisions, serving real customer requirements and improving productivity.

Metastorm e-Work provides the vital process layer in enterprise application architectures, creating competitive advantage by implementing systems that reflect our customers' unique ways of doing business. Armed with comprehensive activity and status reports and the ability to readily change and update solutions, e-Work users can institute a culture of continuous improvement.

XML Web Services Overview

XML Web Services present a new way of building IT applications based on XML messaging rather than object models. Web Services are based on universally accepted XML standards and the HTTP protocol.

The Web Services stack comprises the following layers:



Universal Description, Discovery, and Integration (UDDI) is a standard for "directories" of Web Services. It enables organizations to quickly and easily locate Web Services.

Web Services Description Language (WSDL) is an XML format for defining Web Services and the interface to them.

Simple Object Access Protocol (SOAP) is a lightweight XML based protocol for exchange of information in a decentralized, distributed environment. It consists of three parts: an envelope that defines a framework for describing what is in a message and how to process it, a set of encoding rules for expressing instances of application-defined datatypes, and a convention for representing remote procedure calls and responses.

Typically, each XML Web Service is available as an HTTP URL at a well-known port. A service comprises operations, equivalent to functions. These operations are called in a transactional fashion using the SOAP. SOAP is an XML messaging standard, initially proposed by Microsoft but now enjoying widespread industry acceptance and submitted to the W3C standardization process.

Web Services and Business Process Management

Despite being over used, the term paradigm shift is highly appropriate to Web Services. The shift changes the way IT platforms are architected. A service-oriented model is emerging. The model focuses on what the business does and how it interacts with external entities rather than highly technical issues such as middleware.

Facilitated by XML and its ubiquity, service-oriented architectures address the shortcomings of business objects and the traditional approach of hard coding process flow into binary code. Although, object

orientation is a mature approach of constructing software, it should be applied for what it was designed, technical infrastructures, and not business problems.

Business objects have failed to deliver on the re-use promise and have often become an obstacle to scalability. Furthermore, they have been a dubious way of modeling the enterprise and its interactions with external entities by paying too much attention to the entities themselves rather than the interactions with them. However, it is precisely these interactions that are of interest to an organization and not some vague universal definitions of business entities. The natures of such interactions are volatile - especially in an interconnected B2B world. They tend to change and synchronizing business objects with such changes can be a nightmare affecting the day to day business of the organization.

A set of fine-grained Web Services - implementing specific business tasks- is a new flexible architecture and can facilitate rather than undermine business change and the re-alignment of IT application blocks. Applications are constructed by simply assembling such Web Services internal or external.

What the shift highlights is the need for comprehensive Web Services management (BPM) tools. Because services represent elements of a business process, BPM becomes the new business object – one that acts as the binder for those services and determines their flow.

Metastorm e-Work and XML Web Services – A natural fit

Metastorm e-Work is renowned for its rapid process development, deployment, and management capabilities. Furthermore, e-Work offers a number of features that makes it potentially the ideal tool for building integration with XML Web Services.

The entire e-Work process management can be driven by the XML based Transaction Protocol (TP) API via DCOM/COM+ or HTTP.

Being a single-call API, TP calls can be made by any HTTP capable environment with support for basic XML processing making client-side proxying of an e-Work service extremely easy. Because of its declarative and transactional nature, the e-Work TP API maps easily to the Web Services paradigm. Consumers of an e-Work Web Service do not need to proxy and understand a complex object model or set of functions. Instead, the emphasis is on business semantics encoded within XML messages.

The TP API lends well to dynamic business models as it facilitates exposing on demand, different parts of an eProcess through a Web Service. Any stage or action of the process can become a Web Service by

simply passing the correct XML message to the transaction protocol. Slightly modified WSDL files with prefabricated requests can act as a Web Service for invoking a specific functionality in the process.

e-Work's server-side scripting facility can be instrumental in easily integrating existing Web Services within current process models. Scripts can be written to use both the UDDI and SOAP Toolkit from within e-Work procedures. This greatly eliminates the otherwise significant development effort to programmatically integrate Web Services within a process model.

The e-Work Tracker Process - A practical application of XML Web Services

The e-Work tracker process allows a user to request that a package be sent by Federal Express by completing the FedEx Package Shipment Request blank form.

When the package has been collected by FedEx, the organization's shipping department completes the FedEx Tracking Number field. The package is moved on to the "Package with FedEx stage". As the package is moved to this stage, the status field is updated using the FedEx Tracker Web Service.

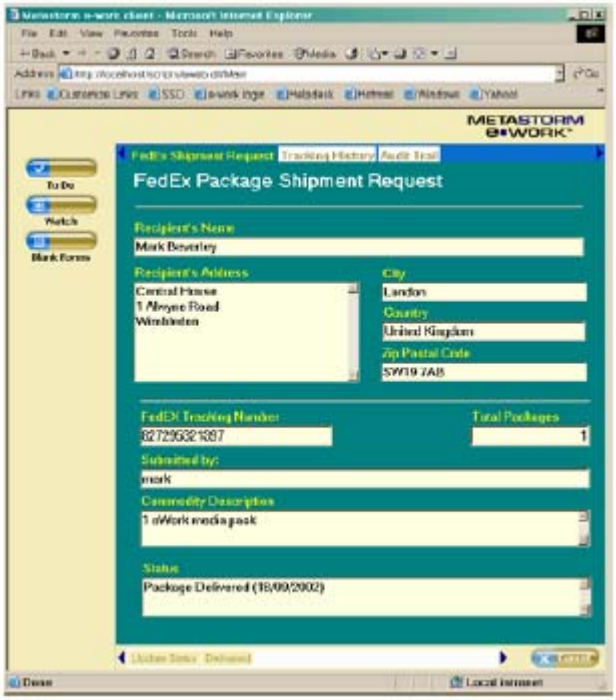


Figure 1. FedEx Tracking Form

While at this stage in the process, the status is updated automatically at least every 12 hours by e-Work. A user who wishes to track the progress of the package more frequently can do so by taking the Update Status action.

When the package has been delivered, the user takes the Delivered action. This also updates the status field and moves the folder onto the Delivered stage where it remains for one month before being automatically archived.

A history is maintained within the folder of all actions that have happened including the status returned by the FedEx Tracking Web Service each time it is queried.

The process not only allows users an easy way to keep track of their shipping requests but with a little modification would also allow an organization to keep a check on all of the packages they have sent by FedEx, who requested them to be sent, who they were sent to and how long they took to get there. The process becomes a valuable source of management information.

This e-Work process demonstrates a practical application of XML Web Services that would be of value to many organizations today.

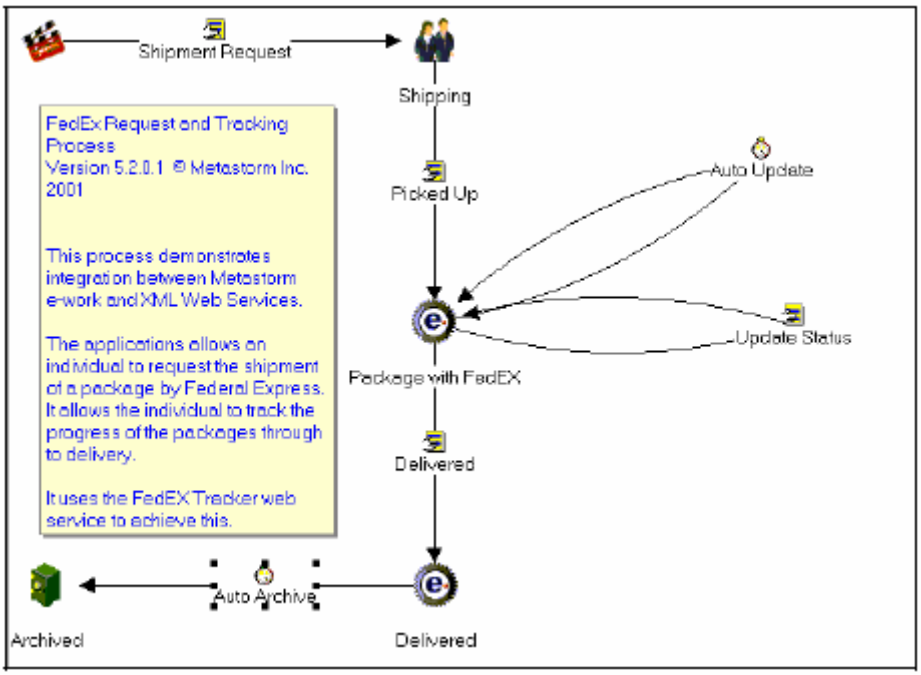
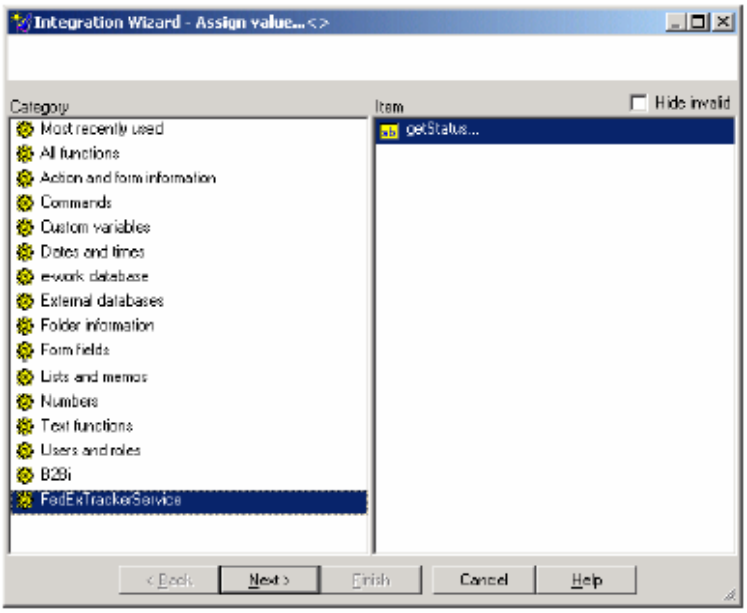


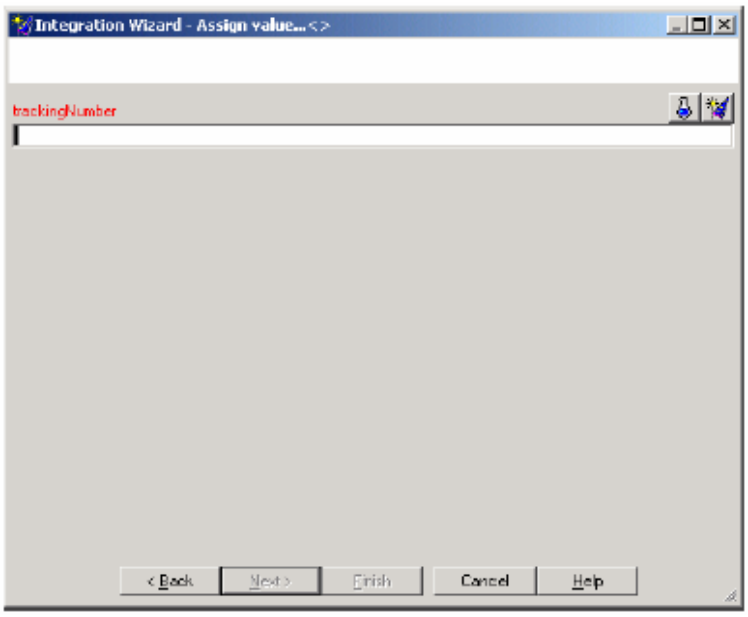
Figure 2. FedEx Tracking Process

Calling Web Service Operations from the Metastorm e-Work Designer

e-Work's Active Application Integration comes with support for a powerful integration option, server-side scripting. This facility can be used to integrate XML Web Services as if they were e-Work functions. The Federal Express Tracker service example can be called from an e-Work process by creating a simple VB script that works as an e-Work script function.

This can be taken one step further. A Web Service functions category can be added to the Integration Wizard with the Service's operation listed as e-Work functions. This is achieved by modifying the e-Work Designer's XML Configuration file.

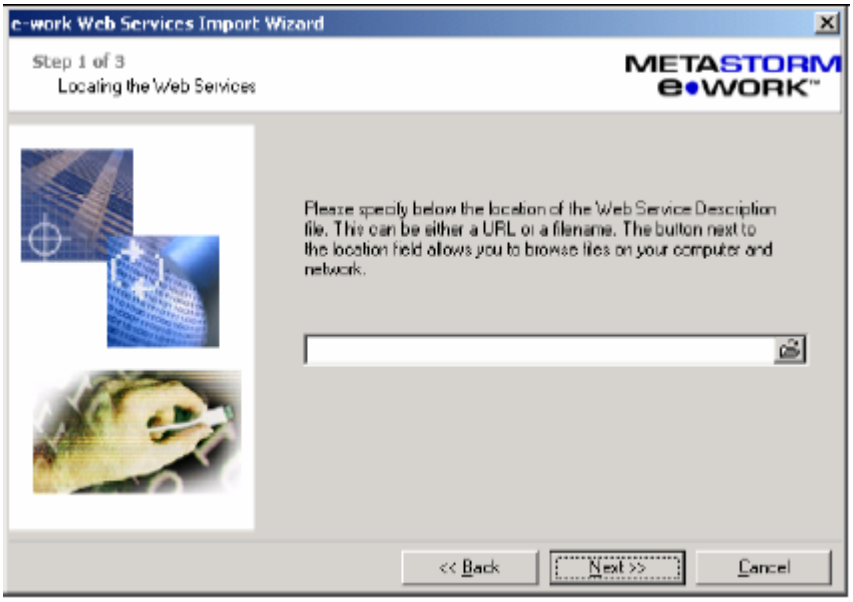




The process of updating the e-Work Designer's Integration Wizard has been automated with the provision of e-Work's Web Services Import Wizard.

The Metastorm e-Work Web Services Import Wizard

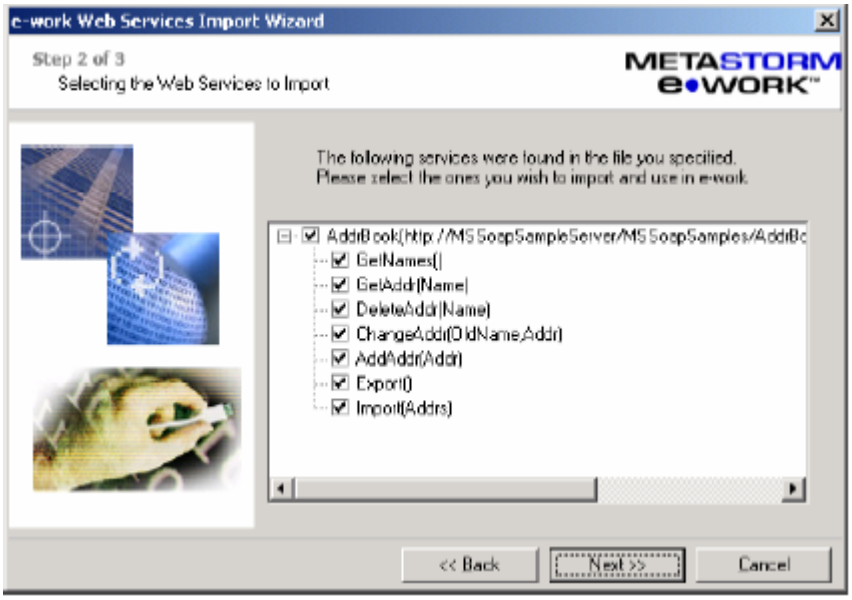
The Metastorm e-Work Web Services Import Wizard provides the ability to add additional Web Service functions to the Integration Wizard. It graphically guides process designers and administrators through the process of importing a Web Service. Once a WSDL file is located, the Wizard lists the Web Services and operations available. It then updates the e-Work process designer configuration files and the imported Web Services are available in the Designer's Integration Wizard like any other e-Work function. Developers and architects are shielded from the underlying marshalling of XML parameters and the mechanics of SOAP.



Step 1

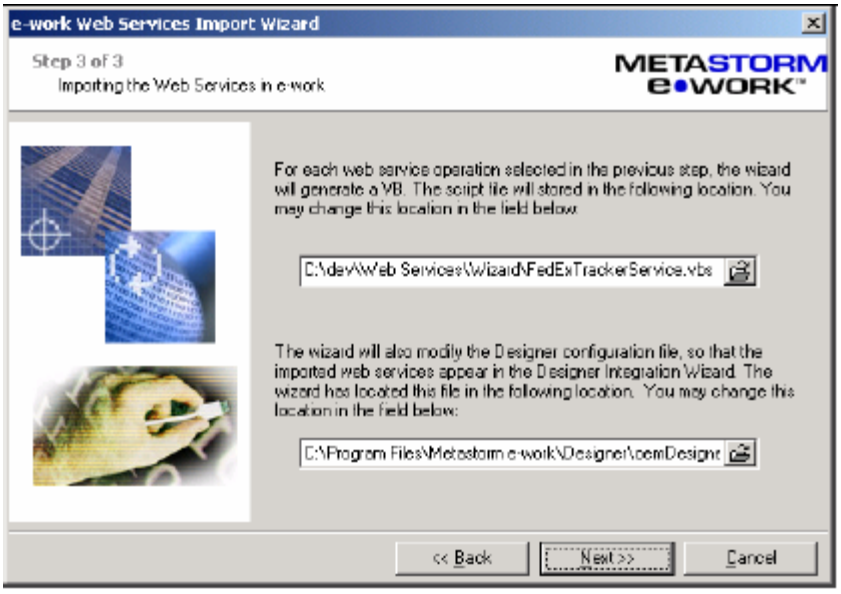
The name of the WSDL file is specified (either as a windows filename or a URL)

The wizard will load the WSDL file and then parse all services and operations into a tree.



Step 2

The user may select from the tree which services and operations should be imported.



Step 3

The user specifies the filename of the VBScript to be generated and the location of the Designer customization file.

Both fields are provided with default values based on the name of the WSDL file and the installation location of the e-Work Designer.

Based on the user selection the script is generated and the Designer customization file is updated.

Exposing Metastorm e-Work processes as XML Web Services

So far we have demonstrated how, in a service-orientated architecture, Metastorm e-Work has the potential to consume Web Services and become the RAD eBPM tool for orchestrating Web Services in a code-free process-oriented fashion.

e-Work can also produce Web Services for consumption by other applications.

Allowing e-Work to expose the actions (write mode) and stages (read mode) of each process as Web Services offers a far better granularity for deploying Web Services. An administrative procedure controls -

at action and stage level – shows which processes are exposed as Web Services generating the appropriate WSDL.

It offers the following advantages:

- It is possible to retrieve and update e-Work data without the need to understand and parse XML
- Role-based access control and subscription-based access is available using the administrative procedure
- Load balancing and host independence: The WSDL standard of hard coding the service host limits the raw TP Web Service to one machine. By contrast, the PLWS model offers a middle-tier that allows the dispatch of Web Service requests to different engines. The host name specified in the WSDL represents the WSDL dispatcher and not the engine machine.

Metastorm e-Work WSDL Publisher Procedure

The administrative procedure publishes an e-Work action or stage as a Web Service by generating - on the fly - the appropriate WSDL. The WSDL publisher provides a form to specify the following parameters:

Parameter	Description
e-Work Process	A process published in the e-Work database
Stage	The stage which the action to be published originates from. If left blank then the creation action of the process is published as a Web Service
Action to Publish	This is the action for which the Web Services will be generated (Write mode). If a stage name has been selected in the previous field, this field can be left blank to publish the status of the folder as a Web Service (Read mode)

Web Service Name	The name given to the generated Web Service. This is normally the name of the selected processes with spaces replaced with the "_" character. Note that the resulting WSDL file will contain a service with this name, and the action name will be used as the operation name.
Web Service Host	The host where the WSDL file will be stored.
WSDL File location	This is the path where the WSDL file will be stored. The location should not include the filename, as it is generated automatically by the procedure.

Once the WSDL file is generated, it can be used from any Web Service compatible application.

Loan Application Example

The Loan application demonstrates how an e-Work action in any e-Work process can be provided as a Web Service. The e-Work process map summarizes the process flow of the sample application. The application conditionally processes loan requests based on the amount and term of repayments. Any request for less than 1,000 and paid within 12 months is approved automatically.

In this application, instead of using the standard blank form creation action feature, applications written outside of e-Work (VBScript, Java, Delphi,) create new folders via a Web Service.

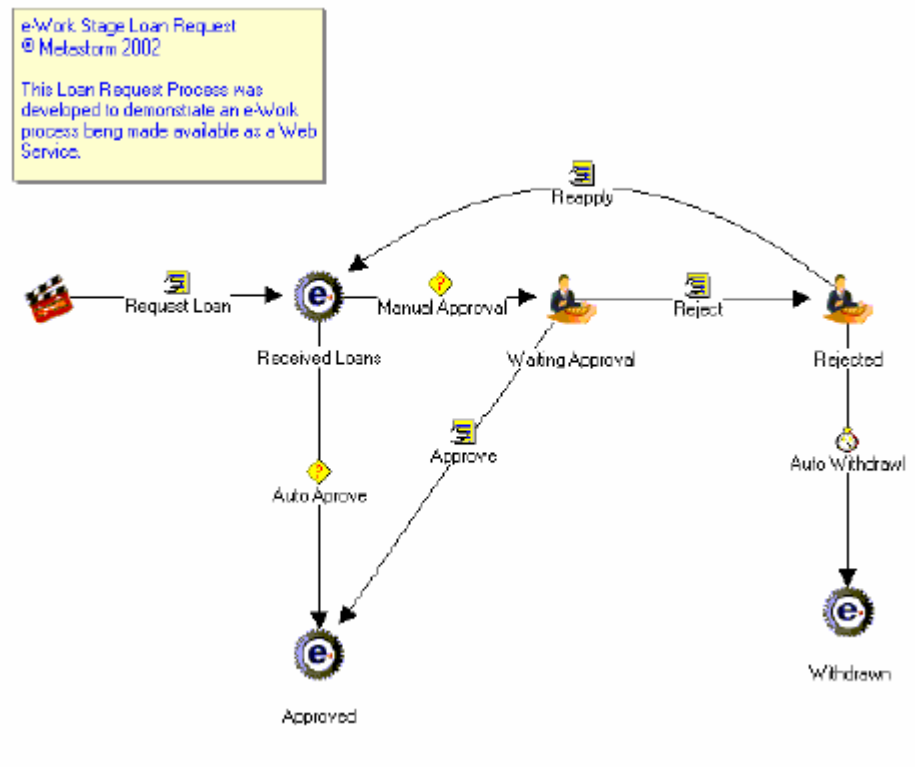


Figure 3. Loan Request Process

Once the process is developed it becomes available to the WSDL Publisher administrative procedure. The picture below illustrates the options set to expose the folder creation action, Request Loan, as a Web Service for consumption by another application. For those familiar with WSDL a preview mode is provided through the memo field at the bottom of the form.

Figure 4. WSDL Generation Form

The Web Service can be consumed by any applications that are capable of calling a Web Service.

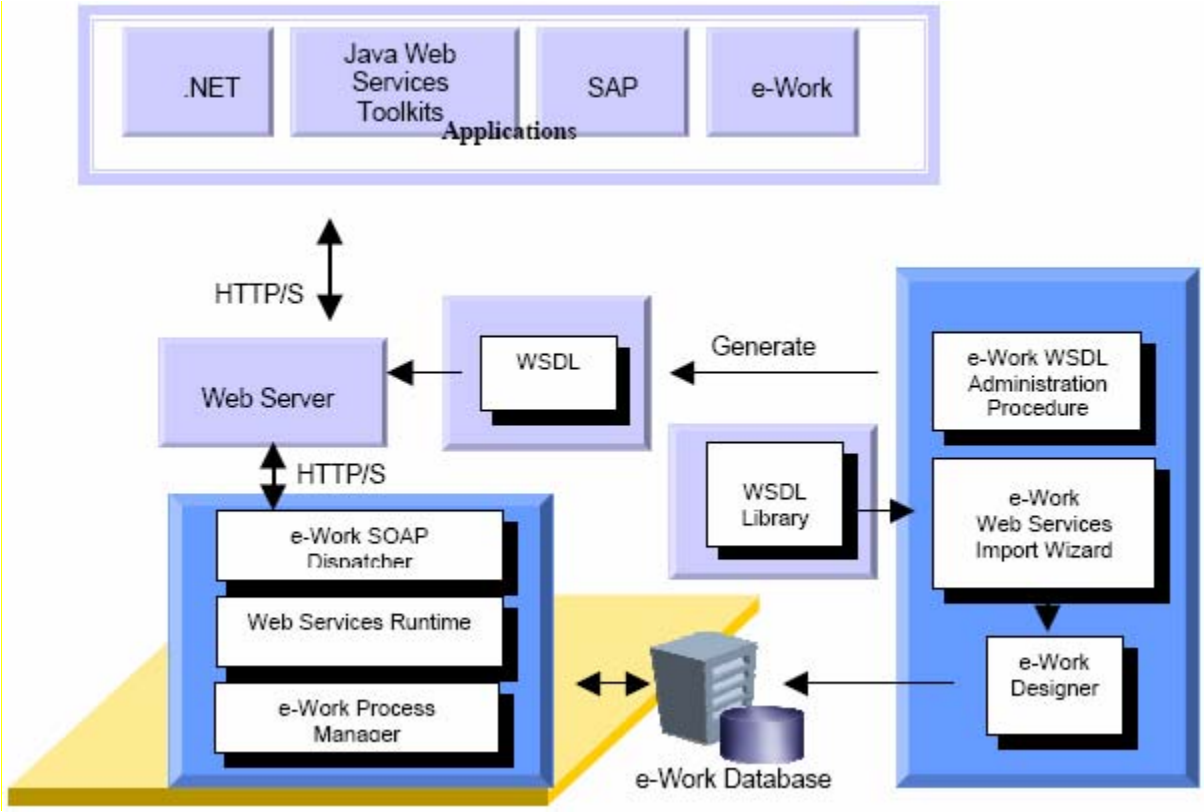


Figure 5. Web Services integration with Metastorm e-Work

Conclusions

Web Services are becoming the driving force for rationalizing IT infrastructures based on XML, open standards and focus on business processes. They are still evolving and many issues (Quality of Service, security) need to be further addressed. However, in today's economic environment they represent an opportunity for streamlining businesses and IT infrastructures to achieve a better return on investment.

e-Work is the market leader in managing and orchestrating the multitude of Web Services that are starting to emerge. It is also the first tool to provide code-free generation of Web Services from business processes.

It can therefore be instrumental in easing the assessment, development, deployment and management of service-oriented architectures without the risks and the learning curve inherent in traditional development techniques.

About Metastorm

As the leading provider of business process management software for automating, managing, and controlling processes, Metastorm is the only company helping organizations achieve Enterprise Process Advantage™ - a heightened level of business performance resulting from increased process efficiency, control, and agility. With a focus on complex, human-centric processes that are unique to their organizations, Metastorm's 700+ global client base in manufacturing, financial services, business services, healthcare, and government are achieving rapid ROI and unique process advantage in customer service, supply chain operations, risk management, and internal operations. More information about Metastorm is available at www.metastorm.com.

METASTORM®

1-877-321-META (6382) +44 (0) 208-971-1500 www.metastorm.com