

Integration with Metastorm e-Work

A Metastorm White Paper

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Among the defining characteristics of Business Process Management (BPM) technology is its ability to tie together disparate applications. To achieve this, BPM must offer several methods for integration so that organizations can employ the most appropriate skill sets for a particular integration task – a necessity for developing BPM solutions.

As the premier BPM technology used by more than 700 organizations, Metastorm e-Work offers multi-tiered integration for many different applications, both client and server based.

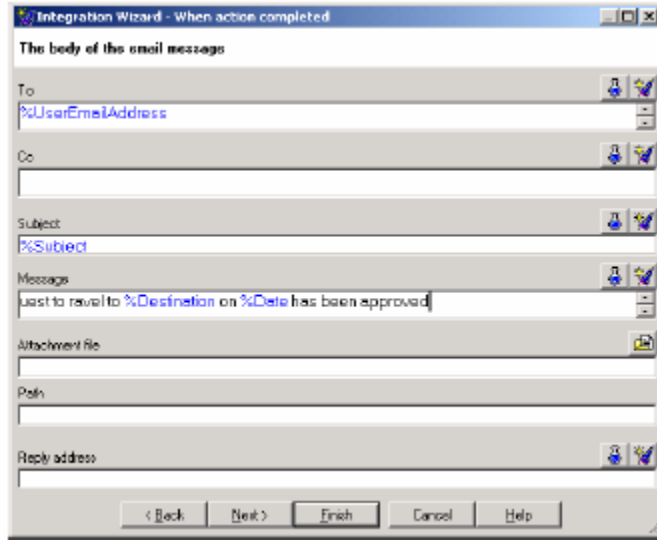
This paper discusses the various integration options and offers considerations to help organizations decide which is best suited for their particular needs.

Integration Choices

Metastorm's research shows that most business processes require integration to external systems - word processing packages, email systems, enterprise application integration (EAI) packages and databases. Because of this, e-Work was designed from the outset with an open architecture.

e-Work's Integration Wizard provides integration to many popular applications via 'fill in the form' screens, drastically speeding up development and reducing maintenance complexity. This avoids the lost time and challenge associated with writing complex scripts or using programming languages, all of which slow down the creation or changing of processes. Popular Integration Wizard functions include:

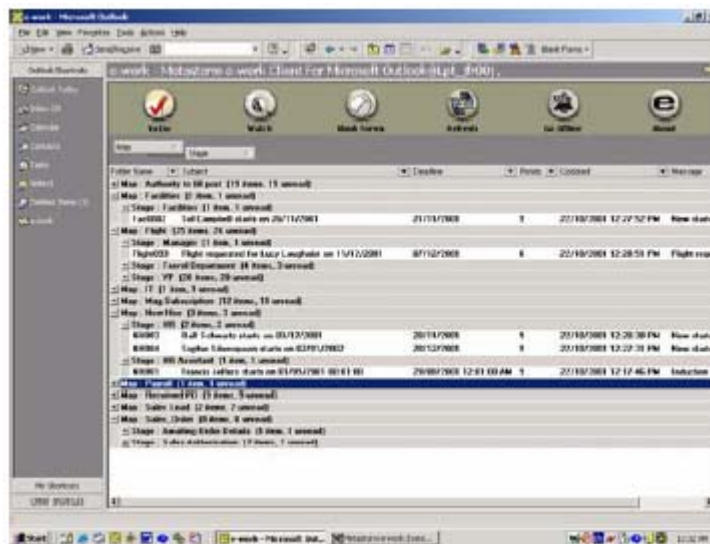
- Send Mail, which sends email via SMTP or MAPI;
- Print/Merge document, which allows data from an e-Work folder to be merged into a Word template; and
- Database functions that allow data to be extracted from and updated in 3rd party databases or the e-Work repository.



Integration Wizard Send Mail form

Even when the Integration Wizard is not used for a particular integration, it can extend e-Work's functionality with Microsoft® Visual Basic® Scripting Edition (VBScript) or Microsoft® JScript®.

Metastorm offers “Out of the box” integrations to a number of standard and popular products. For Microsoft Outlook and Novell GroupWise clients, e-Work provides integration with its user services (the To Do and Watch lists, and the initiation and advancement of items through a process). There is also an e-Work Web Part for the Digital Dashboard in Microsoft SharePoint Portal Server. URLs are provided to integrate e-Work facilities into Web pages, and an Accelerator for Microsoft BizTalk allows e-Work to exchange data with other BizTalk-compliant applications.



e-Work integration for Microsoft Outlook

Systems integrators, corporate developers and independent software vendors (ISVs) can use the SDK to build integration for applications for which there are no adaptors.

Developers also can add functions to the Integration Wizard, or when they need to build e-Work user services into their own clients. The SDK comprises software components, documentation, a help system and sample applications. This integration course is often taken by large organizations with the resources for developing complex integrations. Given the many different methods for integration, Metastorm encourages customers to consider which would be most appropriate for any particular integration.

Client Integrations

There is frequently a requirement to provide integration between an e-Work process and other applications running on the client computer.

External Form Integration

e-Work provides a rich forms-development environment as part of its Designer to allow tight integration between forms and the process. To supplement the forms available in e-Work, integration is accessible for HTML forms built in HTML forms designers such as Microsoft FrontPage or Dreamweaver, and Adobe PDF forms. By mapping the fields on the forms onto variables in the e-Work Designer, these forms can also be integrated into a process; e-Work then displays the external form when required, and automatically ensures that the submitted data is redirected into the process and stored in the e-Work repository database.

Use of external forms allows users to initiate or carry out a process from a public Web site - a valuable benefit since the individual designing the process would not know and cannot control the type of browser that will access the form.

Intranet Integration.

Organizations that wish users to initiate processes directly from an intranet page can achieve this by using the e-Work integration URLs. These allow the Web master to place a URL on the page that calls an e-Work form or an external form to initiate an e-Work process. The author can add instructions to these URLs indicating the next page to be displayed after the form has been submitted or cancelled.

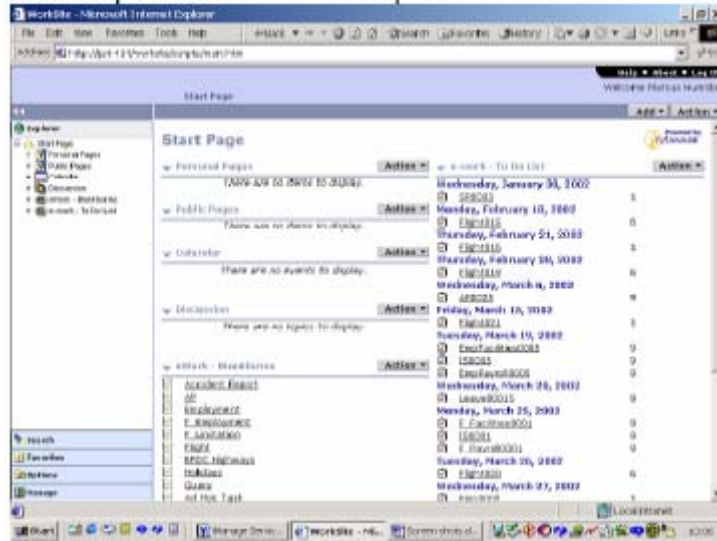


Intranet page to initiate e-Work Process

URLs are also available to build a Web page displaying a user's To Do list, which may be filtered to show folders only in certain processes or at certain stages in a process. These allow custom client pages to be included in an Intranet.

Portal Integration

For organizations that use portals, there is an invariable need to integrate the processes into the portal. Use of URLs mentioned above can help organizations reach this goal, but it won't always have the necessary flexibility to quickly update information structures or change the associated processes. A more appropriate method is integrating e-Work's process capabilities into a portal via e-Work's Transaction Protocol (TP). It provides those experienced in XML and XSL flexibility to deliver e-Work user services in the portal that reflect the portal's look and feel.



e-Work integrated with a Portal

The e-Work TP allows any client or server application to access e-Work and initiate or advance a process. Registered users can open their To Do, Watch and Blank Forms filters and lists, see their e-Work folders and contents, and take all the available actions that advance folders through a process. The e-Work TP is based on synchronous, structured message exchange; hence client processes submit requests and receive responses in plain text with the format defined by the TP and a XML encoding. When XML messages arrive from the TP or are being passed to the TP, e-Work's XML Adaptor enables an XSL Transformation to be applied to them. This provides the developer with control over the look and feel of the e-Work interface.

Low level browsers

The TP also can be used in conjunction with an ASP Listener and the XML Adaptor to deliver e-Work services to non-Windows clients such as PDAs or HTML 3.2-level browsers. Implementations for low-level devices cannot use all the sophistication of e-Work forms, but will deliver to the maximum functionality of the device.

Custom Clients

With e-Work Client Components, developers can build a personalized e-Work Windows client, or build e-Work process capability into existing Windows clients, using all of e-Work's distinctive functionality:

- Login to e-Work
- Get To Do, Watch and Blank Form Lists
- Open an e-Work folder

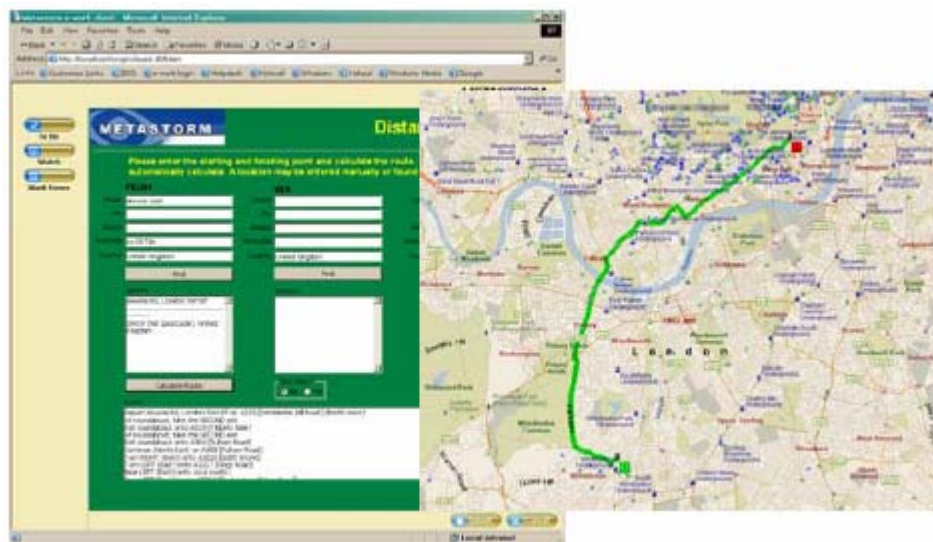
- Navigate between e-Work folder pages
- Invoke, commit and cancel e-Work actions

Client Components, which can be used with any programming language that supports ActiveX controls, can be applied in a non-visual fashion to customize a client from within automation or scripting environments. Developers building custom clients with Swing or another Java UI component library may use component-based e-Work bean interfaces, which provide similar functionality to the ActiveX Client Components.

Alternatively, if a custom client is required to deliver e-Work process capabilities through a Web browser, organizations with the appropriate skills and infrastructure can use Active server pages (ASP) or Java server pages (JSP) in conjunction with the e-Work TP. All of the facilities of the TP are available together with the benefit of merging information into the ASP / JSP pages from other sources.

Client Application Integration

Integration with Windows client applications such as Microsoft Excel or Microsoft MapPoint is best achieved using VBScript or Jscript on the client. This is available with the e-Work client for Outlook, GroupWise or Digital Dashboard, or when an Internet Explorer browser is used on a Windows platform. Functions are provided to extract data from e-Work forms and supply it to the 3rd party application, or take data from the e-Work application and populate fields on e-Work forms.



e-Work integration with Microsoft MapPoint

These scripts are developed in an external text editor, or in the e-Work Designer's syntax color-coded script editor, which supports either VBScript or JScript. Once a script has been developed, the functions defined in it are associated with e-Work events using the Formula Editor, or the Integration Wizard.

Integration to Server Applications

Extensive options are available for integration with applications running on e-Work or some other server. These include integration with J2EE applications, Microsoft BizTalk, and the use of message queues and Web services.

3rd Party Applications

3rd party applications can trigger e-Work's "Raise Flag" feature when they initiate a new folder in a process or advance a folder through a process. e-Work continually monitors flag raisings and the associated data transfers, and it presents the appropriate options to users to take action. Flag raisings occurs by one of three means:

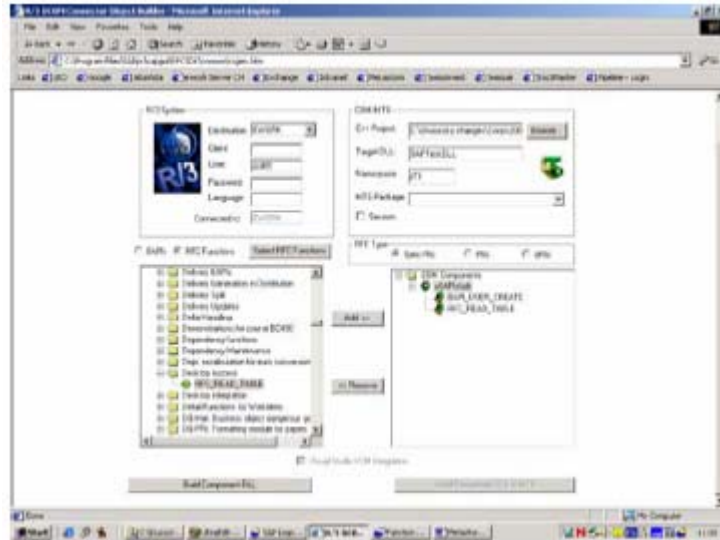
- the e-Work TP
- the Raise Flag control, a non-visual ActiveX control that can be used programmatically from any environment supporting ActiveX controls, such as programming tools and scripting environments
- A RaiseFlag.exe file that can be run by any application capable of running an .exe file.

Integration via Scripting

The use of VBScript or JScript discussed above also can be used to build integration components between e-Work and other server-based applications.

This integration is most likely to be used via DCOM and is an efficient method for exchanging data between two applications. Scripts can be run either synchronously or asynchronously and may be used exclusively to build the integration or in conjunction with other integration facilities.

An example of the use of scripting is to integrate e-Work with SAP. SAP provides Remote Functional Calls for most SAP actions and functions. SAP also provides a DCOM Connector Object Builder that is used to build an integration dll that can be called by an e-Work script.



SAP Connector Object Builder

It is unlikely that scripting would be used to integrate with applications on servers outside of the firewall because of the issues that arise in providing a secure DCOM channel. Inside the firewall, some organizations shy away from the use of scripting with DCOM because of the complexities in establishing DCOM permissions.

Web Services

Web Services are becoming a more popular choice for integrating e-Work with other applications, both for consumption of Web Services provided by other applications, and for providing Web Services that are consumed by other applications.

e-Work offers Rapid Application Development (RAD), code-free integration of Web Services within a business process. The e-Work Web Services Import Wizard 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, and then updates the e-Work Process Designer configuration files. The imported Web Services are then available in the Designer's Integration Wizard, just like any other e-Work function. Developers and architects are shielded from the underlying marshalling of XML parameters and the mechanics of SOAP.

e-Work also offers a facility for acting as a Web Services publisher. Administrators can select process actions and stages, and then expose them as standard SOAP-compliant Web Services that automatically generate a WSDL file with no need for additional coding.

Web Services are typically used for integration with applications over the Internet, intranets or extranets. For applications outside the firewall, Web Services integration has significant advantages over scripting since the use of DCOM is not required. It also offers major benefits if applications are likely to be moved or if several applications must integrate with the same e-Work process.

Message Queues

In a Java environment, Java Messaging Service (JMS) is a fundamental and proven technology for unifying messaging-oriented middleware infrastructure in a portable manner that integrates with the J2EE platform. The e-Work Messaging Service (EMS) for JMS allows process owners to control the message flow from a business perspective and allows J2EE architects and developers to align JMS architectures to a business view of the enterprise. EMS demonstrates the use of both Point to Point & Publish and Subscribe architectures, and it leverages e-Work features such as the TP, scripting and Web Services to interface with the JMS. A JMS listener is also available to asynchronously notify e-Work of messages posted by other applications to the message queue.

The EMS can also be used with non-J2EE products such as IBM MQ Series Messaging.

J2EE

e-Work provides a comprehensive set of technologies to integrate J2EE applications and BPM. It can act as both service provider within J2EE environments and as a J2EE service orchestrator.

A reference implementation of Java connectivity middleware is available, collectively known as e-Work APIs for Java. The middleware consists of layered Java interfaces to suit different application development requirements. The interfaces encapsulate the functionality of e-Work and integrate it with key J2EE building blocks such as Remote Method Invocation (RMI), Java Authentication and Authorization Service (JAAS), JMS and Enterprise Java Beans (EJB). Three different styles of connectivity are available:

- Synchronous, transactional XML messaging via the Transaction protocol - e-Work java request broker (EJRB)
- Asynchronous messaging
- Component-based bean interfaces

The first two have been discussed above, while the third involves the e-Work Bean Framework (EBF), a set of stateful session Enterprise Java Beans encapsulating e-Work semantics in an object-oriented fashion.

Determining which technique is appropriate for a particular integration will depend upon the transaction volume, available development skills and application requirements. XML messaging is better suited to high transaction volumes where performance and scalability are critical. Since state management and expensive instantiations of objects for each transaction is avoided, EJRB is preferable on the basis of raw performance and scalability.

However, for typical business applications the way the Transaction Protocol is used is likely to be similar, if not exactly the same as many standard patterns will be written. Use of the EBF is highly recommended if the e-Work TP is widespread through business logic code as it encapsulates best practices in a reusable manner. Similarly, if in-house skills are primarily based in Java objects rather than XML processing APIs, then use of EBF can offer an easier path in learning how to program e-Work semantics.

Finally, the type of client will determine the choice of API. For Web clients, use of XSLT and XML messaging offered by EJRB is better suited to the stateless nature of the Web.

This also applies to B2Bi or EAI scenarios where emphasis is on data flows between heterogeneous systems, and their transformation from one format to another. Conversely, the EBF is better suited to building Java-based clients using Swing or any other Java UI component library.

Microsoft BizTalk

The e-Work Accelerator for Microsoft® BizTalk™ Server greatly simplifies the integration of processes and other applications via the Microsoft BizTalk Server, whether the processes are internal or external. This capability provides an automatic application schema generator that enables e-Work forms to act as BizTalk documents, so processes built in e-Work are readily available for integration with the BizTalk mapping tool and BizTalk Orchestration.

e-Work can monitor and act upon incoming BizTalk document flows and use the information from incoming BizTalk documents to update an existing item in a process, or create a new one. An e-Work process can also create BizTalk documents and send them to the BizTalk server for transmission to another application.

Database Integration

Integration with e-Work is not limited to integration with e-Work clients or directly with the e-Work Engine. Process data is stored in the e-Work repository database, which can be accessed via ODBC, JDBC or ADO. This is a favored method of generating regular reports via a reporting tool such as Crystal Reports, Business Objects or Microsoft Excel. Integration can also be achieved directly from the database by use

of triggers or stored procedures. This is only recommended when there is a requirement to push data from the database into some other application.

Conclusion

Many organizations find they need assistance in identifying the ideal integration method, so Metastorm and its partners work with them to determine the best option based on their particular needs and resources. For some, it is e-Work's capability to integrate with several popular client and server applications in the 'out-of-the-box' method that is required, while for others a suite of tools is needed to ease the integration to other systems and bring BPM capability to enterprises. The diversity of these tools – and the options overall – provides organizations with the means to select integration appropriate to their infrastructure and the skills available.

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.



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