



K2 [blackpearl] and the 2007 Microsoft Office system

HOW K2 [BLACKPEARL] INTEGRATES AND EXTENDS OFFICE TECHNOLOGIES

August 6

Learn how K2 [blackpearl] integrates and extends the 2007 Microsoft Office system applications, particularly Visio and InfoPath and the Ribbon UI applications.



ABOUT K2

K2 provides the platform for a new generation of users to collaboratively assemble dynamic business applications from reusable items.

To deliver this functionality, K2 leverages multiple facets of the Microsoft technology platform, notably .NET 3.0, Microsoft Office, Microsoft SQL Server, and for the developer community, Visual Studio.

This paper details the enhancements K2 brings when integrated with the 2007 Microsoft Office system.

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INTRODUCTION

K2 blackpearl integrates with many Microsoft Office applications, including Microsoft Office SharePoint Server (MOSS) 2007.

The client applications, such as Microsoft Word, Excel and PowerPoint 2007, are capable of displaying SharePoint workflow task alerts, including alerts from SharePoint workflows built with blackpearl.

K2 blackpearl can use custom Microsoft InfoPath 2007 form templates to gather workflow data and capture workflow activities. In addition, blackpearl allows customers to build comprehensive process applications using InfoPath forms. The associated data on an InfoPath form is contextualized into the blackpearl process, allowing complex logic, data lookup and business decision-making based on user input and line-of-business (LOB) system integration. This is a significant advancement from simple document routing and list-based approvals.

The K2 Designer for Visio enables workflow design using new or existing drawings, independent of the stencil(s) used to create the drawing.

Note: The SharePoint 2007 integration is covered in the paper [K2 blackpearl and SharePoint: Extending SharePoint 2007 Workflow Capabilities](#).

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DEFINING OFFICE BUSINESS APPLICATIONS

The 2007 Microsoft Office system, including SharePoint and the Office client applications, has evolved to support line-of-business applications known as Office Business Applications (OBAs). These familiar applications can be extended with interfaces and capabilities that allow content to be associated with enterprise data and processes. Productivity applications become endpoints in business applications instead of serving supplemental roles in the process. The entire Office system, from client to server, helps organizations realize productivity gains, as data locked in back-end systems are surfaced in the context of day-to-day business activities.

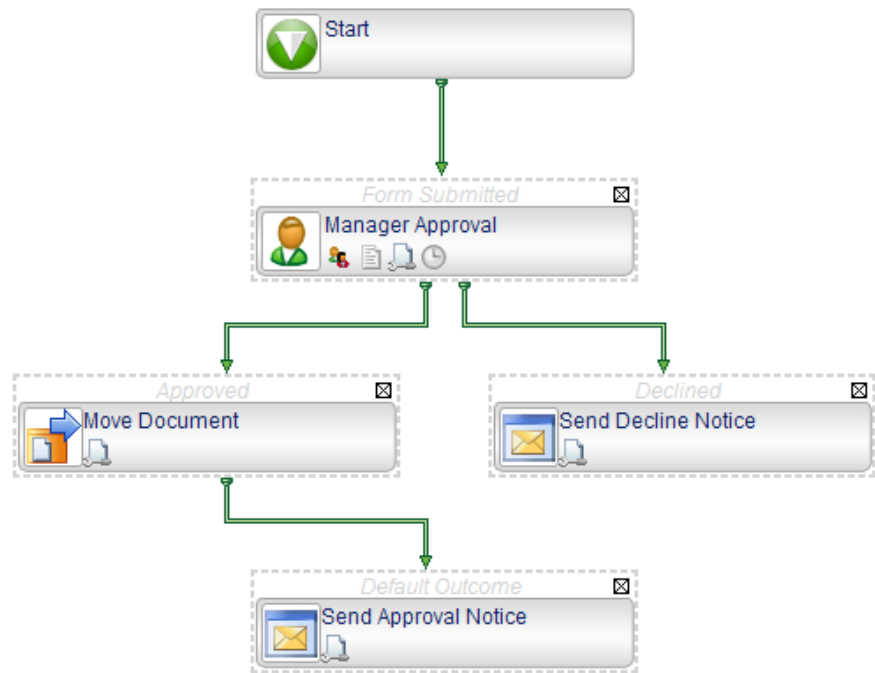
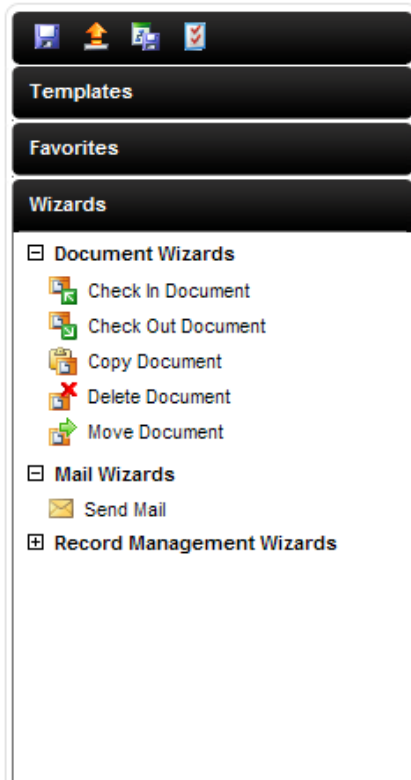
For example, consider a purchase-order-approval process. In a common scenario, a decision maker is presented with an approval form that contains only the necessary information about the purchase order. If the decision maker wants more information about the order, another application is used to find that information. In an OBA, related information, including currently active and pending purchase orders, is shown in Excel or Word to provide context and enable a more informed decision to be made.

To enable OBAs, several new features are included on the server (SharePoint) and client (Office clients) applications that comprise the Office system. In SharePoint, Windows Workflow Foundation (WF) schedules enable workflow and process capabilities that are surfaced in content approval as well as data- and signature-gathering scenarios. Within the client applications, new capabilities to surface contextual data and actions relevant to the document are provided. Using the combination of these capabilities, blackpearl enables users to design and deploy simple and complex business processes using graphical tooling in SharePoint, Visio and Visual Studio. K2 blackpearl integrates with the SharePoint workflow system and uses SharePoint and Office 2007 to automate processes beyond what is possible with the 2007 Office system out of the box.

GETTING STARTED WITH K2 [BLACKPEARL]

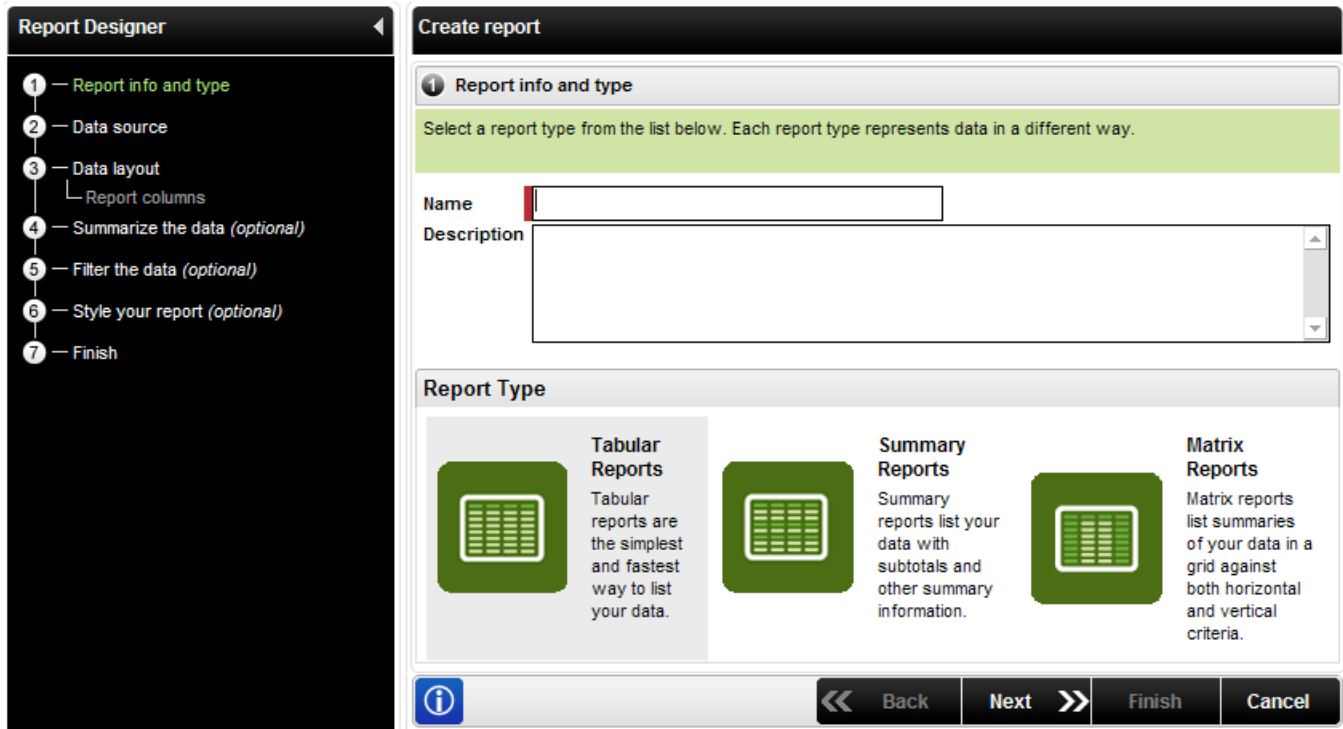
The K2 platform is a family of related products. This strategy allows customers to deploy K2 software at low cost for simple document-routing scenarios, then scale up to enterprise business process deployments based on the most complex business scenarios. At the entry level, K2 Web Designer for SharePoint gives users access to an AJAX-based graphical designer that allows rapid building and deployment of document- and list-based processes.

K2 Web Designer



[FIGURE 1: THE K2 WEB DESIGNER FOR SHAREPOINT]

As process complexity increases, form and data-based process scenarios are built for SharePoint using the K2 Studio Designer or the K2 Designer for Visio. Documents, lists, forms, user permissions and sites can all be modified using these designers. Comprehensive reporting capabilities are available within the K2 Workspace, and an AJAX-based administration interface is available for managing security and designing reports.



[FIGURE 2: BUILDING A REPORT IN THE K2 WORKSPACE REPORT DESIGNER]

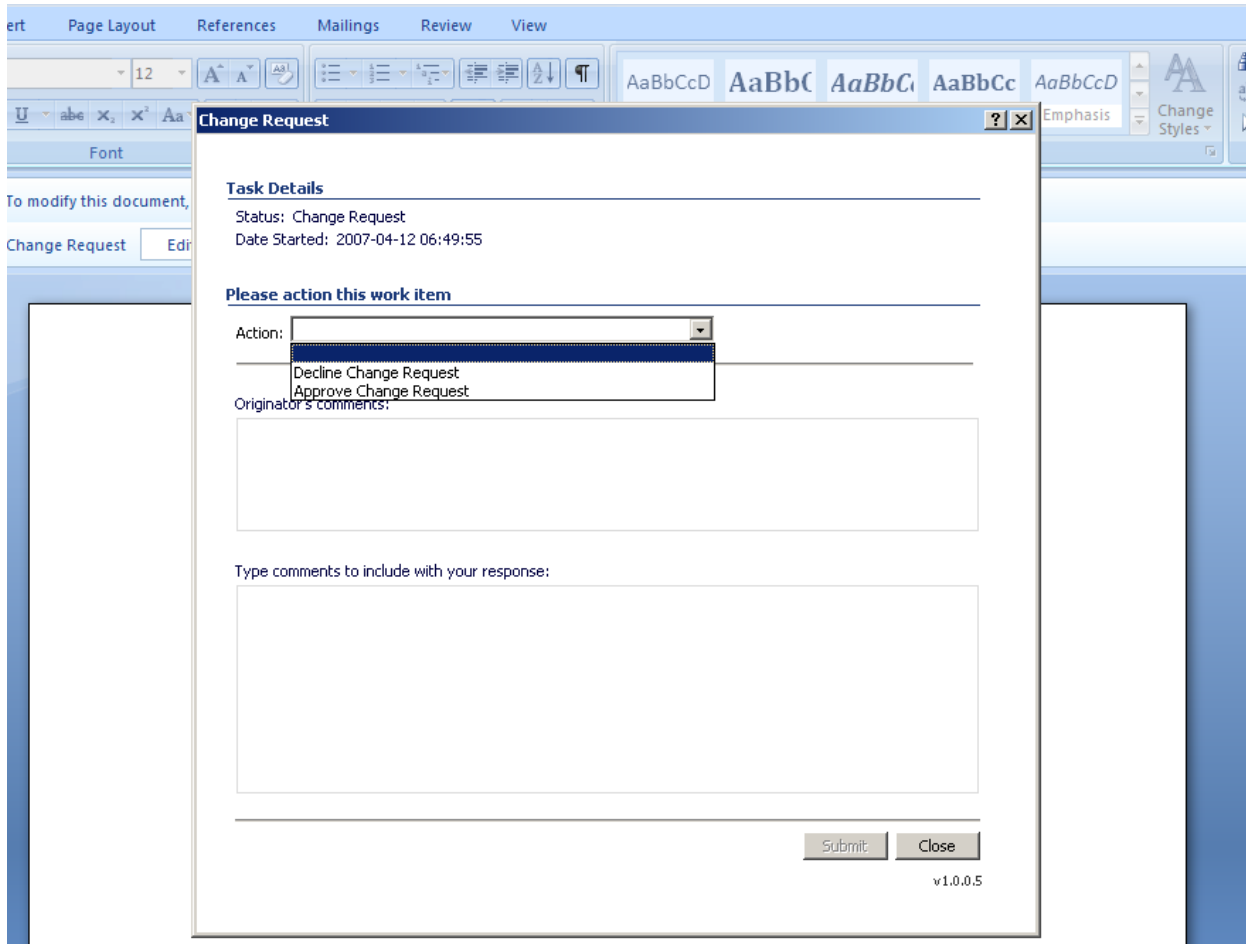
In K2 blackpearl, SharePoint integration can be customized with the K2 Studio Designer, an extension of Visual Studio 2005. The K2 Studio Designer provides a graphical designer and a number of pre-built, functional templates for SharePoint scenarios. For more information about the K2 Studio Designer and SharePoint integration, see the paper *K2 blackpearl and SharePoint, Extending SharePoint 2007 Workflow Capabilities*.

USING WORKFLOWS IN MICROSOFT WORD, EXCEL AND POWERPOINT 2007

K2 blackpearl integrates with Office client technologies in three ways: InfoPath-based workflow forms are shown in each application, the Message Bar is used to display workflow task notifications, and the Workflows menu is available to control workflows associated with Office documents. K2 blackpearl reports can also be published as Excel workbooks to snapshot and analyze a report.

DISPLAYING INFOPATH FORMS IN OFFICE

Designing blackpearl workflows for use with Microsoft Office documents allows the process designer to expose custom workflow forms inside an Office application. These custom forms must be InfoPath forms used for client events and must be browser-compatible, meaning that they can be rendered by a server running InfoPath Forms Services. This functionality is supported by a subset of the 2007 Office system applications, namely Word, Excel and PowerPoint 2007.

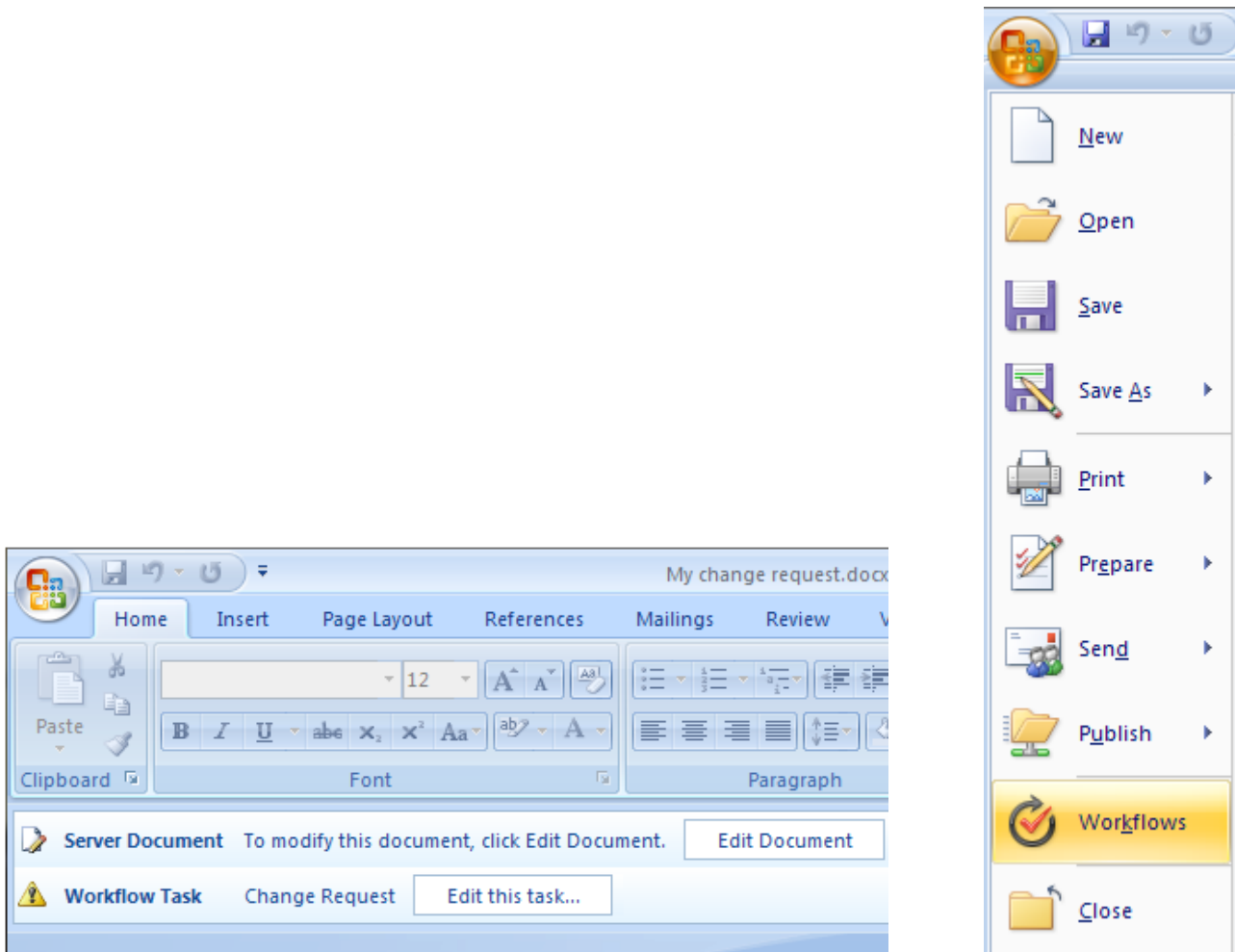


[FIGURE 3: AN INFOPATH-BASED WORKFLOW TASK ACTION FORM DISPLAYED IN A DIALOG IN WORD]

MESSAGE BAR INTEGRATION FOR TASK MANAGEMENT

Another Office system integration point is the Message Bar. This is the yellow informational bar that is exposed below the Ribbon, or in the case of InfoPath, below the menus and toolbars. The Message Bar alerts users of when a workflow task is associated with the document. Clicking on the Edit this task button, as shown in Figure 5, opens a new dialog that displays the current state of the workflow and the possible actions, if the process designer chose InfoPath forms for the workflow client events. If the process designer chose ASP.NET forms, the user will be taken to a new browser window or tab displaying a similar form.

[FIGURE 4: START A WORKFLOW USING THE WORKFLOWS MENU]



[FIGURE 5: THE MESSAGE BAR DISPLAYING THE TASK NOTIFICATION AND EDIT THIS TASK BUTTON FOR THE CHANGE REQUEST WORKFLOW]

STARTING AND ACTIONING K2 PROCESSES IN OFFICE

The same Office applications that support the Message Bar also include a Workflows menu item on the File menu, or in the case of the applications with the Ribbon UI, from the menu display by clicking the Office button.

EXPORTING K2 [BLACKPEARL] REPORTS TO EXCEL

When viewing a report in the K2 Workspace, a user can export a snapshot of the report to Excel for analysis. This does not create a refreshable Web query in Excel but rather a static report based on the data in the report at the time. Reports can be exported to other formats, such as HTML, and are based on the SQL Reporting Services

export configuration. Refer to Reporting Services configuration documentation for information on configuring export formats.

Note: After exporting to Excel or another program, the report is located on the local system and is not saved on the SQL Reporting Services Web site or the K2 Workspace. Changes made to the report in Excel or another program will be lost if the report is regenerated in the K2 Workspace.

The benefits of publishing a report to SQL Reporting Services:

- > More export options, such as PDF, HTML and RDL definition
- > More options to customize a report
- > The ability to schedule reports and generate change (delta) reports. This is only available for published reports. The Reporting Services interface must be used to schedule reports.

DESIGNING WORKFLOW FORMS WITH INFOPATH 2007

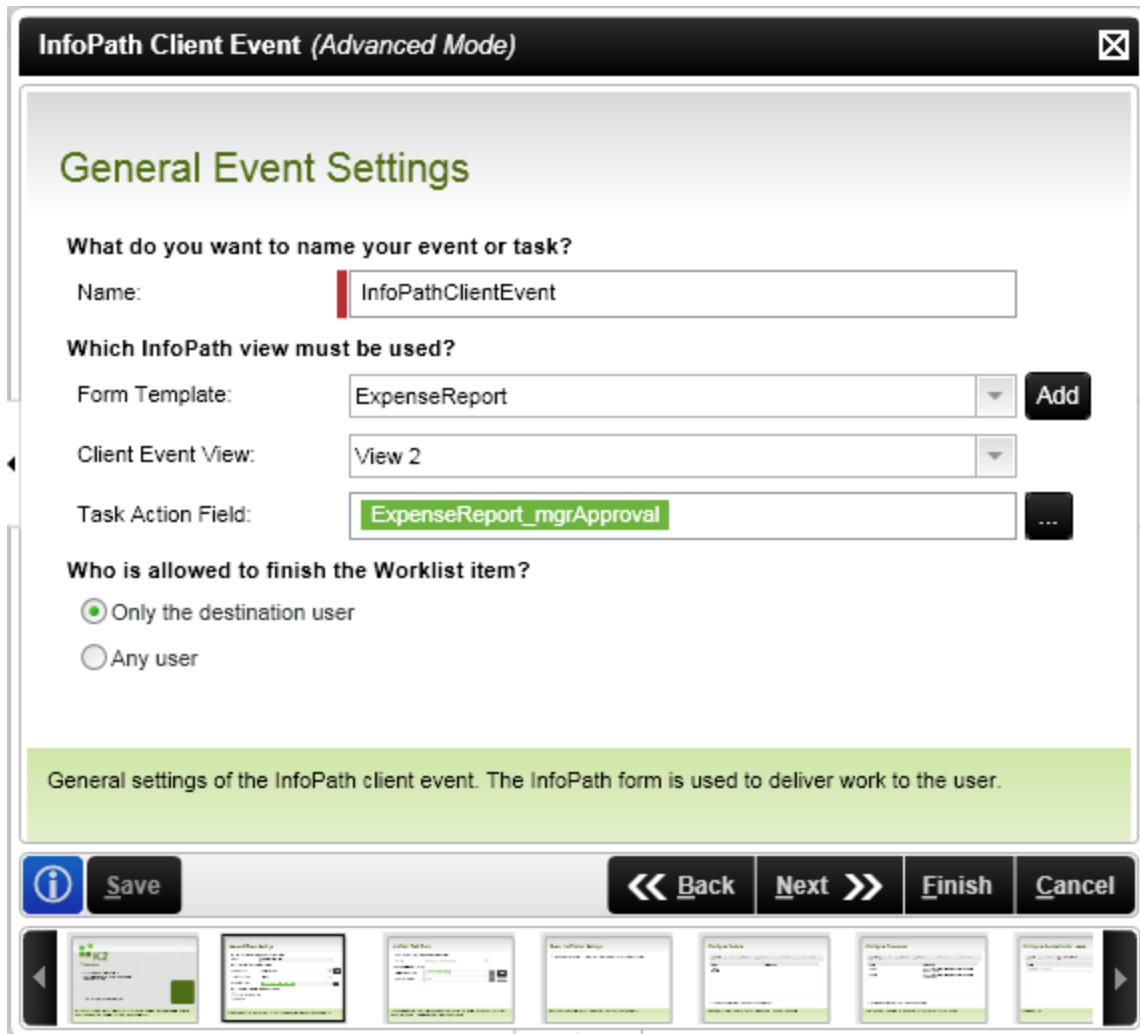
As with K2.net 2003, blackpearl features extensive integration with Microsoft InfoPath. With Microsoft Office Forms Server 2007 or Microsoft Office SharePoint Server 2007 Enterprise, InfoPath forms can be rendered in the browser for a seamless SharePoint experience. Forms for workflow association, instantiation and tasks are pre-built and can be used in blackpearl processes in place of ASP.NET pages.

K2 blackpearl improves upon previous InfoPath integration by abstracting workflow logic from client event forms built with InfoPath. This allows a form designer to insert a control, such as a drop-down list box, in the InfoPath view to display potential user actions. The possible values are automatically populated in the form template by the workflow process, eliminating the need for a form template to be updated when the business logic of the workflow changes. For example, a deployed process contains two actions, "Approve" and "Decline." A third option, "Rework," may become necessary based on business conditions, so the process needs to be updated and redeployed. The InfoPath form template, however, does not require updating because it queries potential actions from the blackpearl Web service associated with the process. Users opening the form in new and existing instances of the process see all three potential actions in the form once the process is updated and redeployed.

ADDING INFOPATH FORMS FOR WORKFLOW TASKS

K2 Studio Designer and K2 Designer for Visio allow custom InfoPath form templates to be incorporated in a process to allow users to perform workflow tasks. InfoPath form templates are added using the InfoPath Client event wizard. A specific view in an InfoPath form template is chosen for each event, which means that a single InfoPath form template can be used for multiple events. Conversely, multiple InfoPath form templates can be used in the process for multiple events. This option is useful when a process contains sensitive data or when security must be tightly controlled.

Figure 6 shows an InfoPath form template being added to a process using the InfoPath Client event wizard. Note that the views are enumerated and shown on this wizard screen in the Client Event View drop-down list box. Set the Task Action Field to the field in the form template used to show available workflow actions, such as "Approve," "Decline" and "Rework."



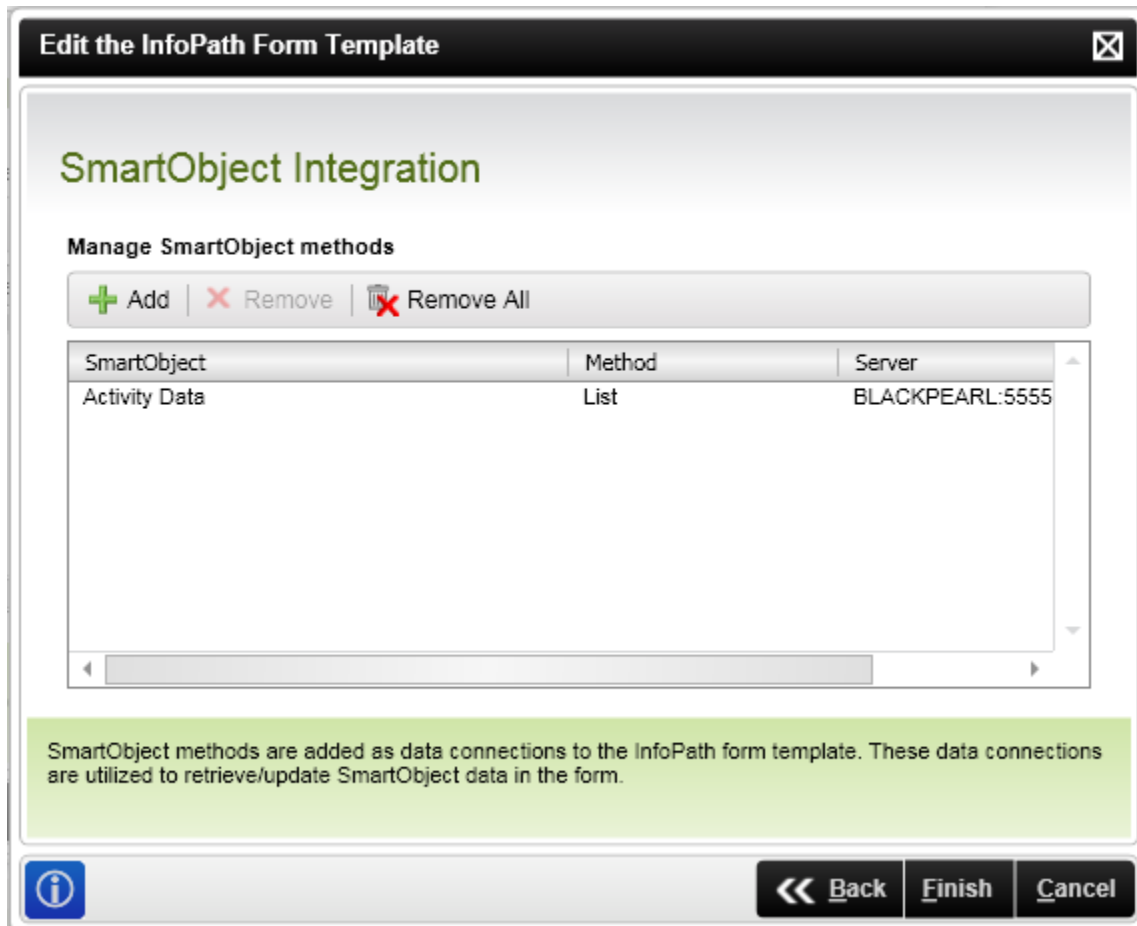
[FIGURE 6: INTEGRATING AN INFOPATH FORM TEMPLATE FOR TAKING ACTION IN A WORKFLOW]

Once an InfoPath form template is incorporated into a process, the form template file (.xsn) is versioned and managed by K2 blackpearl. As with most items added to Visual Studio projects, a copy is made of the original file and stored in the project folder. Modification of the original form template will not result in updates to the form template in the process.

INCORPORATING SMARTOBJECT DATA IN AN INFOPATH FORM

In addition to incorporating InfoPath form templates for use in process events, SmartObject queries can be configured for the form template using the advanced mode of the InfoPath Integration wizard, as shown in Figure 7.

Note: For an overview of SmartObjects see the paper *K2 blackpearl and SharePoint: Extending SharePoint 2007 Workflow Capabilities*.



[FIGURE 7: SMARTOBJECT INTEGRATION WITH INFOPATH FORM TEMPLATES]

Clicking Add in the wizard displays a dialog to select the SmartObject method. For most purposes the List method is used to return a series of records from the SmartObject, whether the SmartObject represents business entity data, such as an organization's employees, or workflow process data.

SUMMARY OF INFOPATH FEATURES

The list below describes these and more features of the integration between K2 blackpearl and InfoPath 2007:

- > Wizard-driven integration of Actions and Outcomes, binding dynamic process logic to the InfoPath form without writing code, and automatic updates if process logic changes
- > Wizard-driven integration of K2 process and SmartObject data, binding with InfoPath forms

- > Access to InfoPath attachments in process design
- > Management of InfoPath views to be displayed per activity
- > Secure control of data through the use of multiple InfoPath forms in a single process
- > Support for InfoPath client-based forms
- > Support for InfoPath Web-based forms (Office Forms Server 2007 or Office SharePoint 2007 Enterprise only)
- > K2 management of solution file (.xsn), including versioning
- > Process inheritance integration
- > Access to schema values through graphical tree navigation
- > Solution Source/Destination support for Network Share, Form Library, Web Folder and Project System

DESIGNING BUSINESS APPLICATIONS WITH VISIO 2007

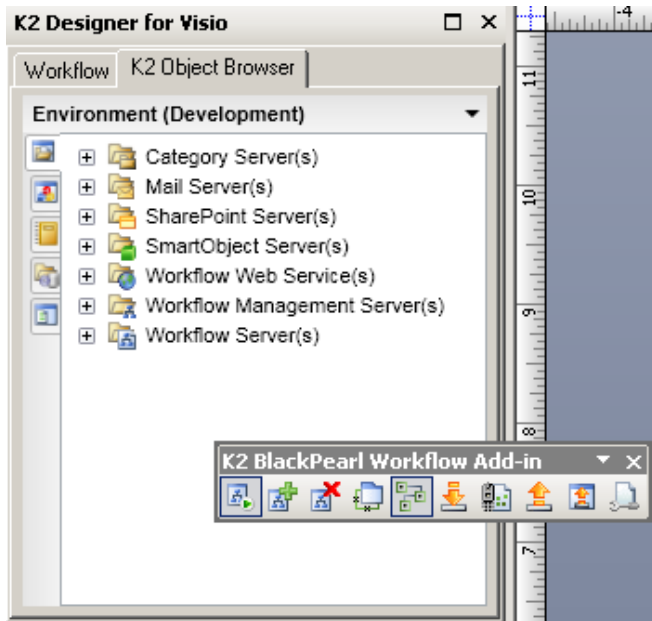
The K2 Designer for Visio is a COM add-in for Microsoft Office Visio 2007, bringing the tools available in the K2 Studio Designer to the Visio environment. By using layers instead of stencils, blackpearl activities, events, and outcomes can be associated with any shape on the Visio canvas. This association is not limited to one activity, event or outcome per shape. For example, multiple activities can be attached to a single shape if the business requirements and existing drawing require it. This can be useful for drawings that do not model a process but need to be used to build and deploy one, such as a floor plan or an architectural drawing of a network.

K2 BLACKPEARL PROCESS DESIGN IN K2 DESIGNER FOR VISIO VS K2 STUDIO DESIGNER

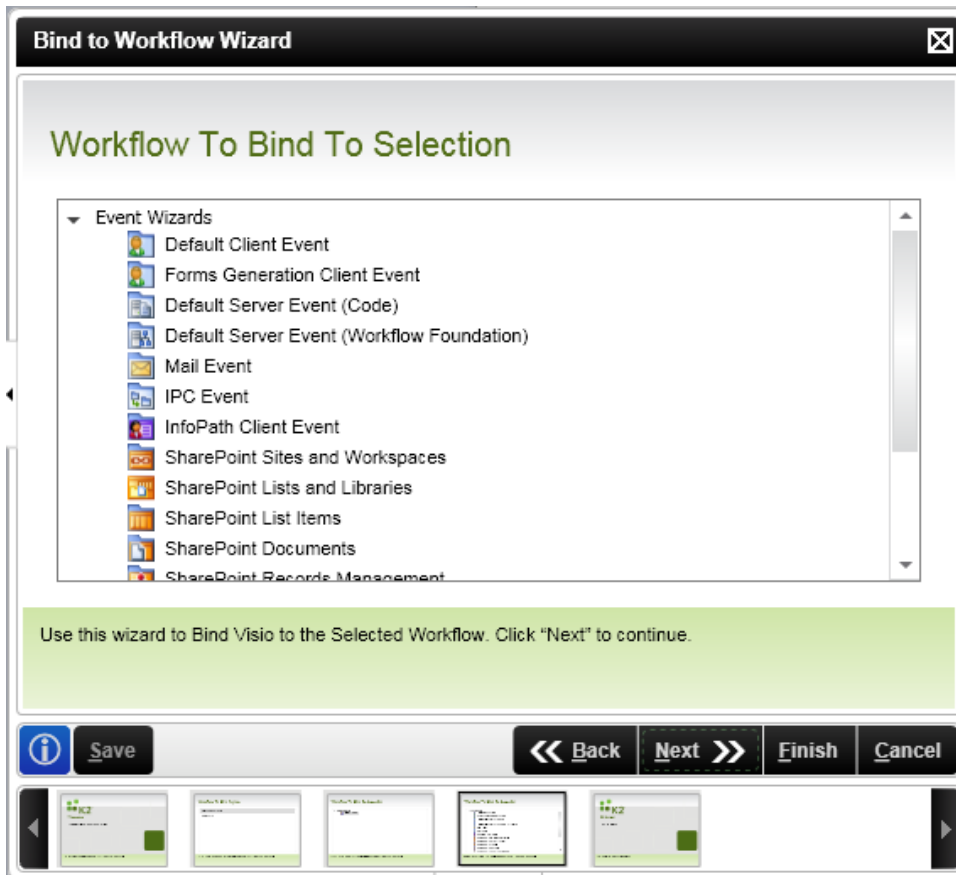
All K2 blackpearl components present in the Visual Studio Toolbox can be inserted on a new or existing Visio drawing. The same wizards available in the K2 Studio environment are used to design specific pieces of a process in Visio, such as adding a SharePoint document event to move or copy a document stored on a SharePoint site. This functionality requires the Windows Presentation Foundation (WPF) components of the .NET Framework 3.0 to be installed on the computer where Visio 2007 is installed.

The K2 Object Browser, which displays the Environment library, process and activity data, and the Workflow Data and User and Roles browsers, is available in Visio as well as K2 Studio. Most processes that can be built in K2 Studio can be built with the K2 Designer for Visio; however, custom code and debugging of processes are not available in Visio. For this type of functionality, including the ability to debug Windows Workflow Foundation (WF) schedules that are part of a blackpearl process, the process can be exported from Visio and then opened in the K2 Studio Designer, extended with custom code and debugged by a developer.

Figure 8 shows the K2 Object Browser and the K2 toolbar in Visio. The toolbar is used to insert new processes and events, as shown in Figure 9. Activities can also be added to a shape by right-clicking the shape and selecting the K2 Integration menu.



[FIGURE 8: THE K2 OBJECT BROWSER AND THE TOOLBAR IN VISIO]



[FIGURE 9: EVENT WIZARDS LISTED IN THE BIND TO WORKFLOW WIZARD]

The toolbar, as shown in Figure 8, provides the ability to:

- > Enable or disable K2 integration on the drawing
- > Add K2 workflow activities to a shape
- > Delete workflow activities from a shape
- > Display the blackpearl layer to show which shapes contain process information
- > Import, export, and deploy a process
- > Change project build settings
- > Change general settings

SHARING A VISIO PROCESS WITH OTHER K2 BLACKPEARL DESIGNERS

It is possible to extend a process designed in Visio, for example, with custom code in the K2 Studio Designer. A visual representation of the process originating from or opened and saved with the K2 Designer for Visio is included in the Studio project as a separate design surface. This allows a developer to reference the Visio-designed process while customizing and extending the process with K2 Studio.

Below is a list of the process sharing capabilities of the various blackpearl designers.

Save from the K2 Studio Designer

- > K2 Designer for Visio — can open and map unbound activities to new shapes
- > K2 Web Designer for SharePoint — cannot open

Save from K2 Designer for Visio

- > K2 Studio Designer — can open and continue designing with no additional tasks
- > K2 Web Designer for SharePoint — cannot open

Save from K2 Web Designer for SharePoint

- > K2 Studio Designer — can open and continue designing; process will be read-only, must be deployed as new process
- > Visio — can open and map unbound activities to new shapes ; process will be read-only; must be deployed as new process

SUMMARY OF VISIO FEATURES

The list below describes some of the features that blackpearl integration with Visio brings to the business user designing workflows:

- > Model processes in Visio using blackpearl Activities, Events and Actions.



- > Use a new drawing or add process extensions to existing Visio designs, regardless of stencil set used.
- > Build and deploy processes directly from Visio.
- > Obtain access to all blackpearl wizards and K2.net 2003 templates, if installed.
- > Bind to existing lines and shapes.
- > Use integrated Command Bar buttons.
- > Auto-bind toggle for the canvas, allowing new shapes to be automatically associated with an Activity or Event.
- > View workflow context menus on shapes.
- > Gain access to the K2 Object Browser, including Environment library.
- > Ability to participate in cross-canvas development and collaborative modeling through export/import of the process definition.
- > Open processes designed in Visual Studio and easily map orphaned activities.
- > Model a process on a diagram without using lines.
- > Associate multiple Activities, Events and Actions to a single shape.
- > Is built on the blackpearl design and authoring APIs.

CONCLUSION

K2 blackpearl extensively integrates with the 2007 Microsoft Office system, allowing users a familiar environment to use, design, participate in and action blackpearl applications.