

Deep Dive into SharePoint 2010 Workflows

Robert Bogue
Thor Projects

Rob.Bogue@ThorProjects.com



Who am I?

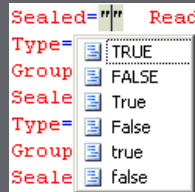
- 7 Time Microsoft MVP currently awarded for SharePoint
- Architect = Developer + IT Professional
- Author of The SharePoint Shepherd's Guide for End Users – and 17 other books.
- Blogger:
<http://www.thorprojects.com/blog>



Always Start with a Joke...

In SharePoint, how many values can a Boolean have?

Six



Agenda

- SharePoint Development Background
- Content Type and Data Entry Example
- Workflow Basics and Options
- Sketching Out a Process with Visio
- Workflows with SharePoint Designer
- Creating Activities in Visual Studio
- Creating Visual Studio Workflows



You want to do what?

SHAREPOINT DEVELOPMENT BACKGROUND



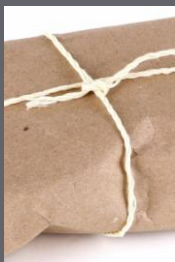
'F'eature

- The key way that functionality is added to SharePoint
- Lives in ...14\TEMPLATE\FEATURES
- Controlled by a Feature.XML file
- Must be installed (every server) and activated (each location but only one server)



'S'olution

- WSP extension
- CAB format
- Transacted installer (think MSI for SharePoint)
- Controlled by manifest.XML
- Created by Visual Studio (or MAKECAB.EXE and a DDF)



SharePointPro
2010 SUMMIT & EXPO

Site Column

- A container for a specific kind of data
- Examples:
 - Field or column in a database table
 - Column or row in a spreadsheet
 - Field on a form



SharePointPro
2010 SUMMIT & EXPO

Content Type

- A collection of fields and non-field properties
- Non-Field properties are:
 - Information Rights Management
 - Workflow
 - Template File



SharePointPro
2010 SUMMIT & EXPO

Types of SharePoint Pages

- In the Content DB (Un-Customized or Customized)
 - Master Pages
 - ASP.NET Master Pages with a twist
 - Web Part Pages
 - Derived from master pages
 - Wiki Pages
 - Basically a web part page with extras
 - Page Layouts (Server)
 - Derived from master pages but with content placeholders
- In ...14\TEMPLATE\LAYOUTS (_layouts)
 - Application Pages
 - Derived from a special set of master pages

SharePointPro
2010 SUMMIT & EXPO

Custom Edit Form (Content Type)

- Display, Edit, and New forms can be customized for lists or content types
- Custom Edit forms in conjunction with tasks can be used to change the path of a workflow



SharePointPro
2010 SUMMIT & EXPO

SharePoint Sandbox

- A generic way to allow end users to upload and run content on SharePoint.
- Consists of both an execution model and a deployment model



SharePointPro
2010 SUMMIT & EXPO



Sandbox Deployment Model

- SharePoint Solution (WSP) deployed to a special solutions gallery at the site collection level
- Site Collection administrators can deploy and activate features
- Can not deploy files to the file system or run fully trusted code




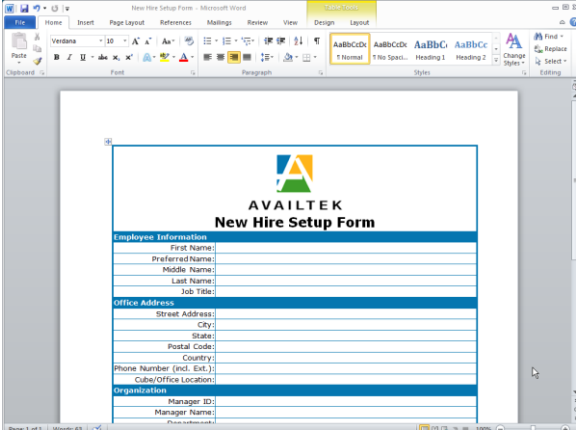

Sandbox Execution Model (aka User Code Host)

- Special highly restricted process with both Code Access Security (CAS) and user token security
- All Sandbox deployed user code runs in this process
- Proxies are required

Video Demo

CONTENT TYPES AND SITE COLUMNS

Employee Information

First Name:	
Preferred Name:	
Middle Name:	
Last Name:	
Job Title:	

Office Address


Street Address:	
City:	
State:	
Postal Code:	
Country:	
Phone Number (incl. Ext.):	

Organization

Cube/Office Location:	
Manager ID:	
Manager Name:	


Demo

USING THE PACKAGE

Got to make the work flow somehow – so it doesn't back up

WORKFLOW BASICS AND OPTIONS



What is a workflow?

- The American Heritage Dictionary for the English Language, Fourth Edition says...
 “1. The flow or progress of work done by a company, industry, department, or person. 2. The rate at which such flow or progress takes place.”



SharePointPro
2010 SUMMIT & EXPO

Why are workflows important?

- Every business process is a workflow
- YOUR organization has wasted tons of money by not automating processes
- Remember the 80s?



SharePointPro
2010 SUMMIT & EXPO

The Greatest Challenge

- Defining the workflow in concrete terms
- The devil is in the details



SharePointPro
2010 SUMMIT & EXPO

What is a SharePoint Workflow?

- Long-Running
- Serializable
- Resumable



SharePointPro
2010 SUMMIT & EXPO

Windows Workflow Foundation (WF)

- SharePoint 2007 and 2010 use WF 3.0/3.5
- WF has radically changed for 4.0
- WF 4.0 doesn't have a State Machine workflow type



SharePointPro
2010 SUMMIT & EXPO

Activities and Actions

- Activities are the components of a WF workflow.
- Actions are a sentence representation of workflows activities that SharePoint Designer uses.



SharePointPro
2010 SUMMIT & EXPO

Starting a Workflow

- **Manual**
 - Manual with Manage Web
- **On Item Created**
- **On Item Changed**



SharePointPro
2010 SUMMIT & EXPO

Workflow Types

- **Manual**
- **Out of Box**
- **Visio**
- **SharePoint Designer**
- **Event Receivers**
- **Workflows with Visual Studio**



SharePointPro
2010 SUMMIT & EXPO

Manual

- **Advantages**
 - Low cost/No cost
 - No development
- **Disadvantages**
 - Low/No control



SharePointPro
2010 SUMMIT & EXPO

Out of Box Workflows

- **Advantages**
 - Easy
 - No development
 - Extensible
- **Disadvantages**
 - Minimally customizable without SharePoint Designer



SharePointPro
2010 SUMMIT & EXPO

Visio

- **Advantages**
 - Business friendly tool
 - Graphical representation
- **Disadvantages**
 - Needs to be finished in SPD



SharePointPro
2010 SUMMIT & EXPO

SharePoint Designer Workflows



- **Advantages**
 - Quick custom workflows
 - No coding required
- **Disadvantages**
 - Limited activities
 - Limited flow control



SharePointPro
2010 SUMMIT & EXPO

Event Receivers

- **Advantages**
 - Simple development
- **Disadvantages**
 - Not good for long running workflows



Workflows with Visual Studio

- **Advantages**
 - Complete control
- **Disadvantages**
 - Requires strong development skills
 - Requires more time to develop




Out of the Box Workflows

- **Foundation (Web)**
 - Tri-State
- **Server (Web)**
 - Approval
 - Collect Feedback
- **Server (Non-Web)**
 - Collect Signatures
 - Disposition Approval

Three State

- **Simple-Easy to use**
- **Model anything that can have three states**




Approval



- **Direct Approval or Rejection of a Document**
 - Expense Reports
 - Meeting Minutes
- **Single-Tier**
- **Serial or Parallel**
- **X of Y Approval**
- **Static or User Selectable Approver (or Approver Group)**

Substantially Improved




Collect Feedback

- **Collect Feedback on a Document or Item**
 - Training Plan
 - Proposed Rule Making



The best way to write code without writing code

SHAREPOINT DESIGNER AND VISIO

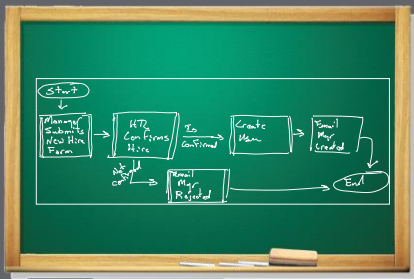


Visio and Workflow

- New SharePoint workflow template
- Exported workflows can be imported into SharePoint Designer
- Not a complete workflow tool – can't specify the details



Start with a sketch



Demo

VISIO AS A WORKFLOW TOOL



SharePoint Designer Workflows

- Rules Engine
 - If-Then-Else
 - And
 - Serial/Parallel activities (Actions)
- Extensible with Visual Studio developed activities



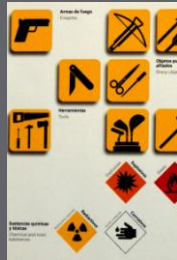
SharePoint Designer Actions

- Add a Comment
- Add Time to Date
- Assign a Form to a Group
- Assign a To-do Item
- Check In Item
- Check Out Item
- Collect Data from a User
- Compare a version of the Document Set
- Copy List Item
- Declare Record
- Delete Item
- Discard Check Out Item
- Do Calculation
- Extract Substring from End of String
- Extract Substring from Index of String
- Extract Substring from Index with Length
- Extract Substring from Start of String
- Find Interval Between Dates
- Log to History List
- Lookup Manager of a User
- Pause for Duration
- Pause until Date
- Send an Email
- Send Document Set to Repository
- Set Content Approval Status
- Set Content Approval Status for the Document Set
- Set Field in Current Item
- Set Time Portion of Date/Time Field
- Set Workflow Status
- Set Workflow Variable
- Start Approval Process
- Start Custom Task Process
- Start Document Set Approval Process
- Start Feedback Process
- Stop Workflow
- Undeclare Record
- Update List Item
- Wait for Field Change in Current Item



SharePoint Designer Conditions

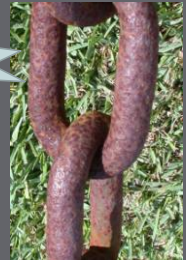
- If any value equals value
- Title field contains keywords
- Created by a specific person
- Created in a specific date span
- Modified by a specific person
- Modified in a specific date span
- Person is a valid SharePoint User



SharePointPro
2010 SUMMIT & EXPO

SPD Workflow Limitations

- No support for:
 - Looping
 - Iteration
 - Debugging
- Must use the first task list



SharePointPro
2010 SUMMIT & EXPO

Custom SPD Actions

- Create a workflow activity in VS and:
 - Create an .Actions File
 - Update the web.config to add an authorized type
- Develop a Sandbox Workflow Action



SharePointPro
2010 SUMMIT & EXPO

SharePoint Workflow Execution

- Declarative
 - SharePoint Designer
 - All activities used must be declared as safe as AuthorizedTypes in web.config
 - While and Replicator are not authorized
 - Runs as the user context
- Code Based
 - Must run full trust
 - Runs the system context



SharePointPro
2010 SUMMIT & EXPO

SharePoint Designer Workflows

- List
- Reusable
 - Web / Site
 - Site / Site Collection
- Site Workflow



SharePointPro
2010 SUMMIT & EXPO

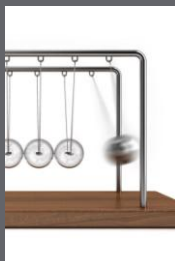
Demo

WORKFLOWS IN SHAREPOINT DESIGNER

SharePointPro
2010 SUMMIT & EXPO

Revising SharePoint Designer Workflows

- Previous versions are renamed (with the time of the next version)
- The previous version is set for no new instances
- New versions are set to allow (new instances)



SharePointPro
2010 SUMMIT & EXPO

Workflow Save As Template

- Creates a WSP that can be imported into Visual Studio
- Can't package global workflows (Those available in all sites in the site collection)



Look for Microsoft Patterns and Practices Guidance on how to package global workflows. (www.microsoft.com/spg and www.codeplex.com/spg)

SharePointPro
2010 SUMMIT & EXPO



When you need or want complete control

VISUAL STUDIO

SharePointPro
2010 SUMMIT & EXPO

Importing SPD workflows into VS

- Importing as a workflow converts it to a mostly functional code based workflow
 - A very large number of activities are generated – to the point of making this nearly unusable.
- Importing as a WSP package leaves the Workflow as a declarative – but the designer doesn't work.



SharePointPro
2010 SUMMIT & EXPO

Workflow Templates and Instances

- VS Creates workflow templates which are associated to content types, lists, and sites
- Workflow instances are created when a workflow runs on an item



SharePointPro
2010 SUMMIT & EXPO

Workflow Types

- **Sequential**
 - Flow Chart
 - Linear Progress
- **State Machine**
 - Status Driven
 - Less defined, or iterative processes
 - Doesn't exist in WF4



SharePointPro
2010 SUMMIT & EXPO

Workflow Associations

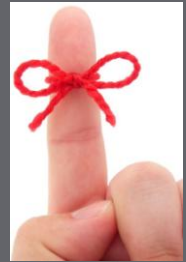
- **Item**
 - Classic 2007 association
 - One running instance per association per item
- **Site**
 - New to 2010
 - Multiple running instances per association



SharePointPro
2010 SUMMIT & EXPO

Activities

- **Simple**
 - Not a container for other activities
 - Generally does something
- **Complex**
 - Container for other activities



SharePointPro
2010 SUMMIT & EXPO

Correlation Tokens

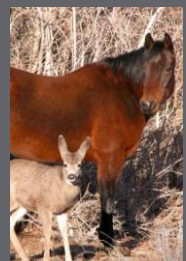
- **Unique Identifier**
- **How WF determines where to send events**
- **Have a container**
 - Normally the workflow
 - Should be inside loop or repeater if in one of those composite activities is a parent



SharePointPro
2010 SUMMIT & EXPO

Dependency Properties

- A WF concept that allows properties to be "sparse"
- Big hash table/lookup to improve space
- Used to link the properties of one activity to another



SharePointPro
2010 SUMMIT & EXPO

Demo

CREATING A SANDBOX WORKFLOW ACTION

SharePointPro
2010 SUMMIT & EXPO

Demo

CREATING A WORKFLOW ACTIVITY

SharePointPro
2010 SUMMIT & EXPO

Association Form

- Displayed when the workflow template is associated to a list, content type, or site
- Used to set up the configuration for the workflow template



SharePointPro
2010 SUMMIT & EXPO

Instantiation Form

- Displayed when a user manually starts a workflow
- Is not displayed when workflows are automatically started



SharePointPro
2010 SUMMIT & EXPO

Modification Form

- Can be used to modify a running workflow
- Practically never used, custom edit forms for tasks are more popular



SharePointPro
2010 SUMMIT & EXPO

Status Form

- The form displayed when the user looks at the status of your workflow
- Rarely changed but powerful for complex workflows



SharePointPro
2010 SUMMIT & EXPO

Application Pages

- Visual Studio Template available
- No visual designer – but automatic wire up of the class and .ASPX



SharePointPro
2010 SUMMIT & EXPO

The Scenario...

- **New Hire Process**
 - Create a network account for the user
 - Set up the user's computer
 - Set up a phone extension
 - Publish information to the corporate directory



SharePointPro
2010 SUMMIT & EXPO

Your Feedback is Important

Please fill out a session evaluation form
drop it off at the conference registration
desk.

Thank you!

