



## Developing Visual Studio Workflows and Activities for SharePoint Sites

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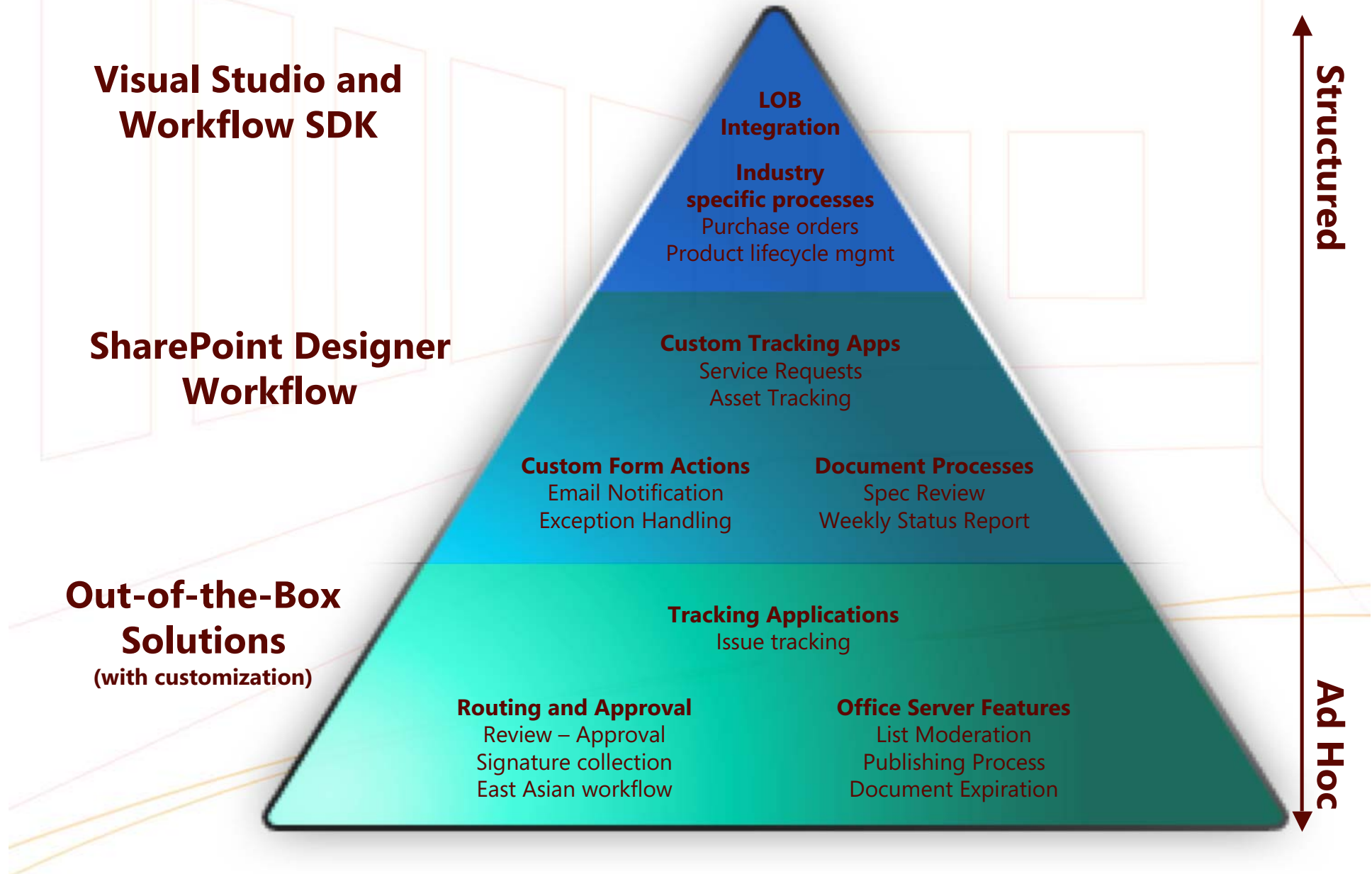
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 Microsoft®  
**Office SharePoint®**  
Server 2007

# Agenda

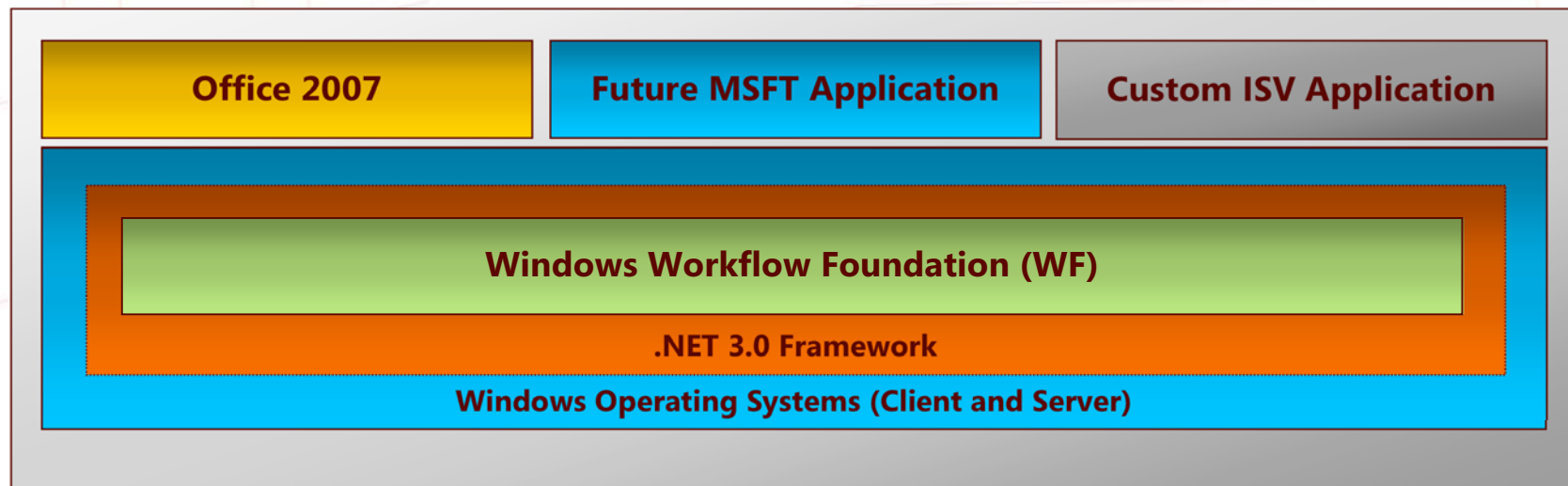
- Workflow authoring scenarios
- Windows Workflow Foundation (WF) overview
- SharePoint Integration with WF
- Demo - Using the workflow
- Developing workflow with Visual Studio
- Demo - Building the workflow

# Workflow Authoring Scenarios



# Windows Workflow Foundation (WF)

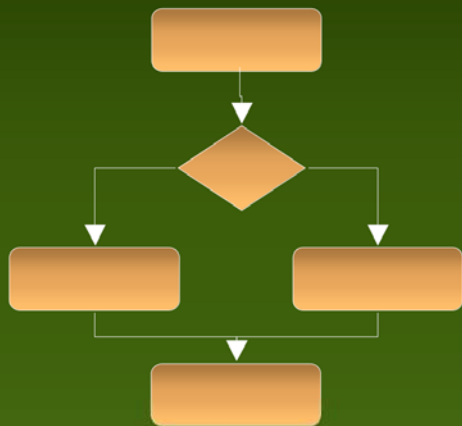
- Single workflow technology for Windows
  - Extensible framework & toolset
  - Base platform for Microsoft, ISV and customer solutions
- A framework for building workflow into applications
  - A framework to build on - not an application or server
  - Exposed to developers via .NET 3.0



# What are workflows?

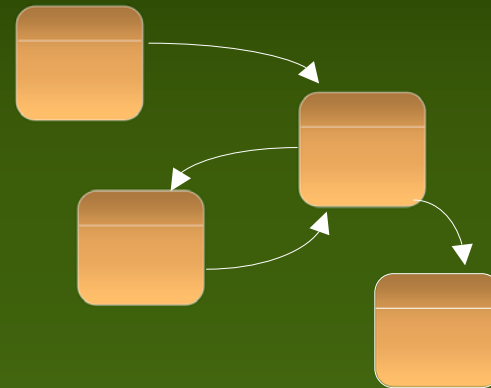
- Encapsulated logic for coordinating business processes
  - provides abstractions to model real world processes
  - valuable for modeling long running and stateful behavior
  - Workflows in WF are decomposed into **activities**

## Sequential workflows



modeled as flowchart

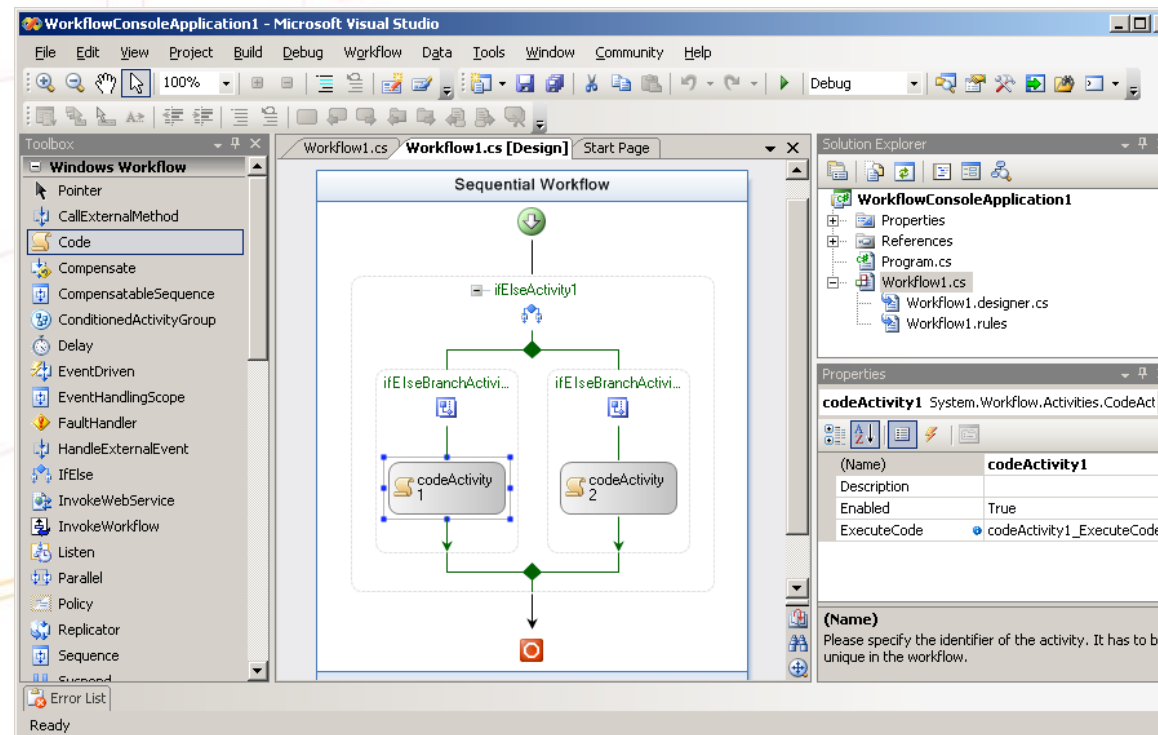
## State machine workflow



modeled as state diagram

# What are activities?

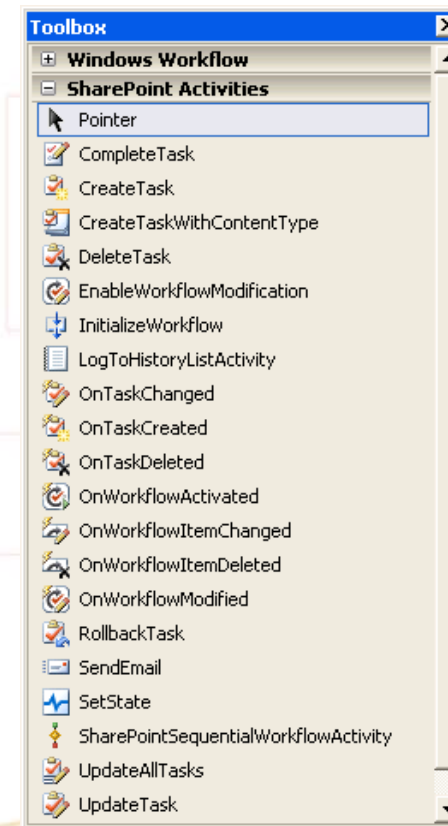
- Activities are reusable components (like form controls)
  - Model based on activity producers and consumers
  - Producer encapsulates logic into reusable black box
  - Producer exposes behavior through **properties** and **events**
  - Consumer drops activity on workflow designer in Visual Studio



# Office Activity Examples

*Activities are the building blocks of workflows.*

- Create Task
- Complete Task
- On Task Change
- Delete Task
- Update Item
- Create Item
- Copy/Delete Item
- On Item Change
- Log to workflow history list



# Creating your own Activities

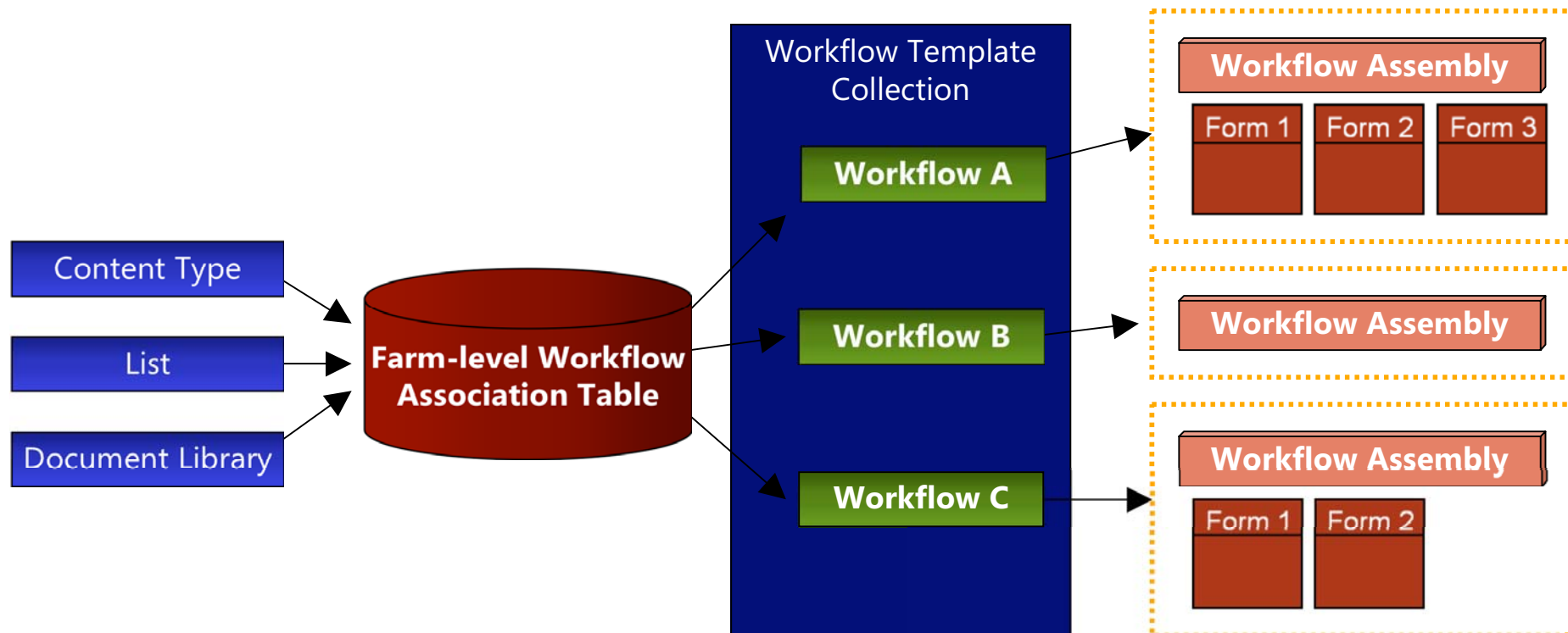
- Create a new Workflow Activity Library project
- Inherit from `System.Workflow.ComponentModel.Activity`
- Must override the Execute method
- Write your custom code
- Define custom Properties

# WSS Workflow Fundamentals

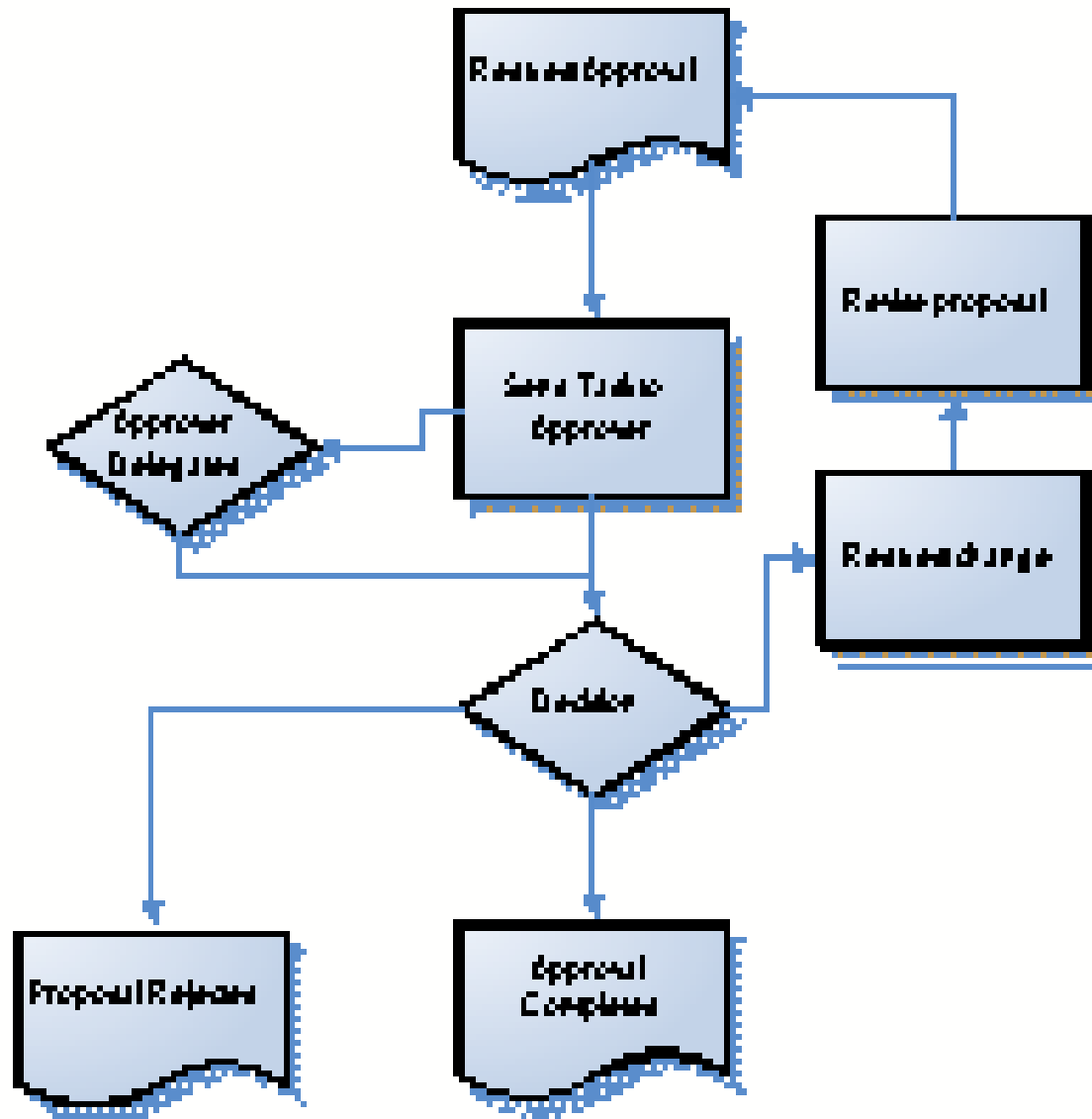
- WSS supports workflows on items and documents
  - WF associated with list, document library or content type
  - WF can be started and completed by user actions
  - WF can be configured to start without user action
- WSS adds a dimension of human accountability
  - All WSS workflows are associated with a task list
- WSS adds a dimension of tracking and reporting
  - All WSS workflows are associated with a workflow history list

# WSS Workflow Architecture

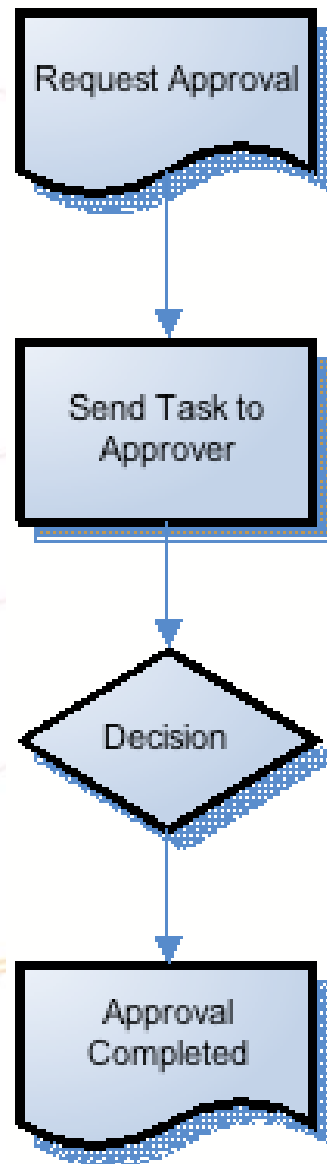
- Workflows are run on items and documents
  - Workflows associated with list, document library or content type
  - Farm-wide table tracks associations to WF templates



# Sample Business Process



# Simplified Business Process



## Using The Workflow

# demo

# Development Steps

1. Model workflow in Visual Studio
2. Create and bind InfoPath forms
3. Deploy to SharePoint server
4. Debug the running workflow

# Model Workflow In Visual Studio

- Prerequisites:
  - Visual Studio 2005 extensions for WF – (RC5)
  - SharePoint 2007 SDK – Visual Studio templates for SharePoint workflow
- Create project of type "SharePoint Sequential Workflow Library"
- Create the workflow

Visual Studio 2005 extensions for WF

<http://www.microsoft.com/downloads/details.aspx?familyid=5D61409E-1FA3-48CF-8023-E8F38E709BA6>

SharePoint Server 2007 SDK:

<http://www.microsoft.com/downloads/details.aspx?familyid=6d94e307-67d9-41ac-b2d6-0074d6286fa9>



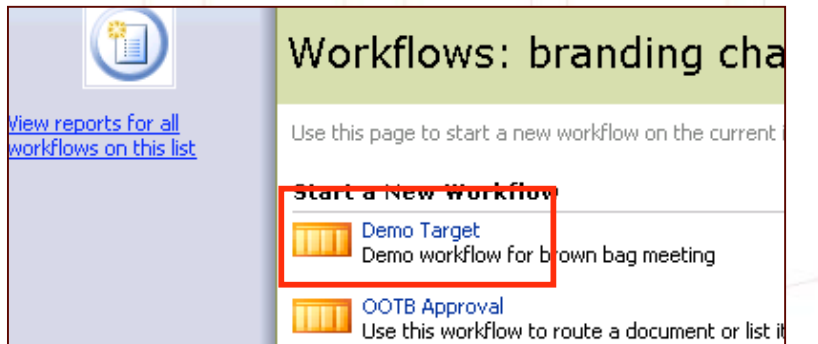
# Create And Bind InfoPath Forms

## Types of InfoPath forms in Workflows

- **Association form**
  - User adds workflow to a list
  - For setting options on WF
- **Initiation form**
  - For manual workflow start
  - Collects workflow parameters
- **Task completion form**
  - A user to edit a task from WF
  - User edits or enters data
- **Modification form**
  - Linked off WF status page
  - Can modify in-flight WF

# Create And Bind InfoPath Forms

InfoPath forms are used in these places



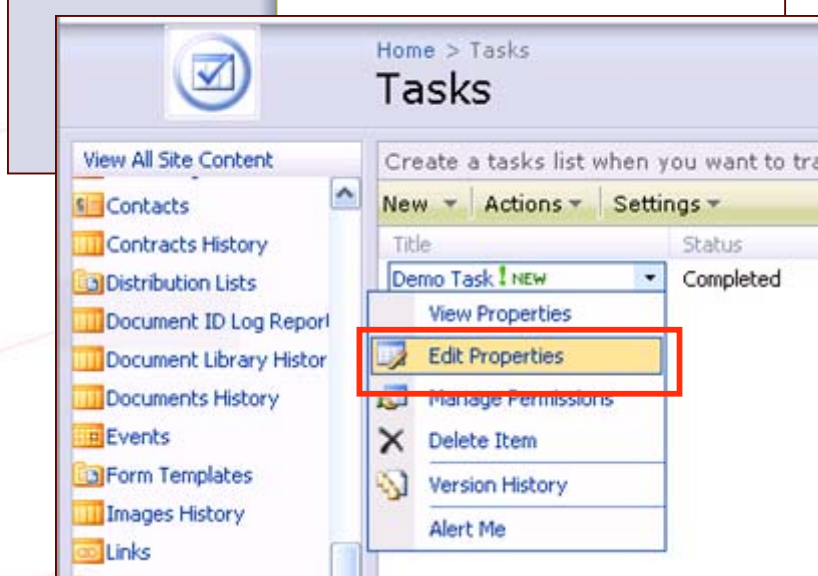
Workflows: branding cha

Use this page to start a new workflow on the current

**Start a New Workflow**

- Demo Target  
Demo workflow for brown bag meeting
- OOTB Approval  
Use this workflow to route a document or list it

View reports for all workflows on this list



Home > Tasks

## Tasks

Create a tasks list when you want to tra

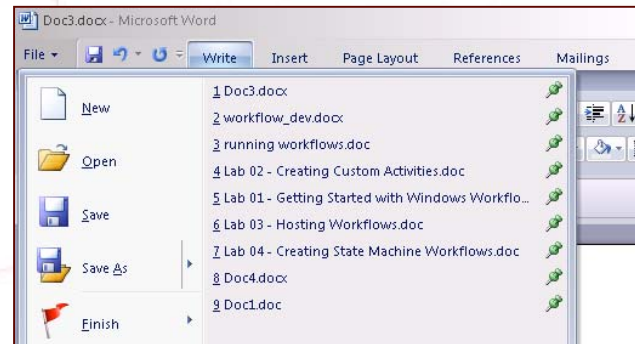
New Actions Settings

Title	Status
Demo Task NEW	Completed

- View Properties
- Edit Properties**
- Manage Permissions
- Delete Item
- Version History
- Alert Me

View All Site Content

- Contacts
- Contracts History
- Distribution Lists
- Document ID Log Report
- Document Library Histor
- Documents History
- Events
- Form Templates
- Images History
- Links



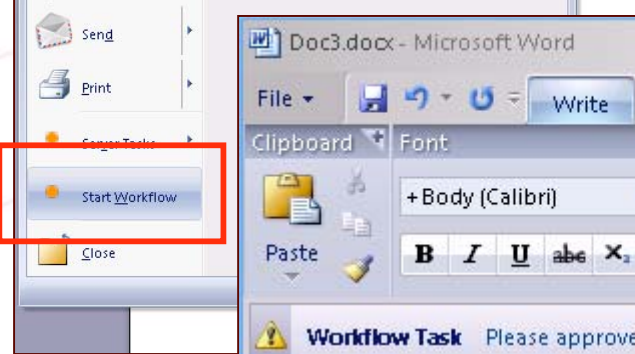
Doc3.docx - Microsoft Word

File Write Insert Page Layout References Mailings

- New
- Open
- Save
- Save As
- Finish
- Send
- Print

- Doc3.docx
- workflow\_dev.docx
- running workflows.doc
- Lab 02 - Creating Custom Activities.doc
- Lab 01 - Getting Started with Windows Workflo...
- Lab 03 - Hosting Workflows.doc
- Lab 04 - Creating State Machine Workflows.doc
- Doc4.docx
- Doc1.docx

Start Workflow



Doc3.docx - Microsoft Word

File Write Insert Page Layout R

Clipboard Font Paragraph

Paste

**Workflow Task** Please approve Doc3

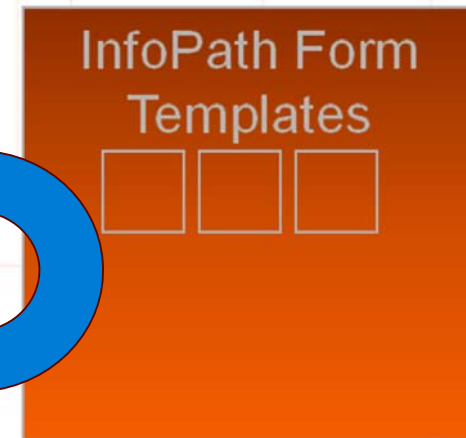
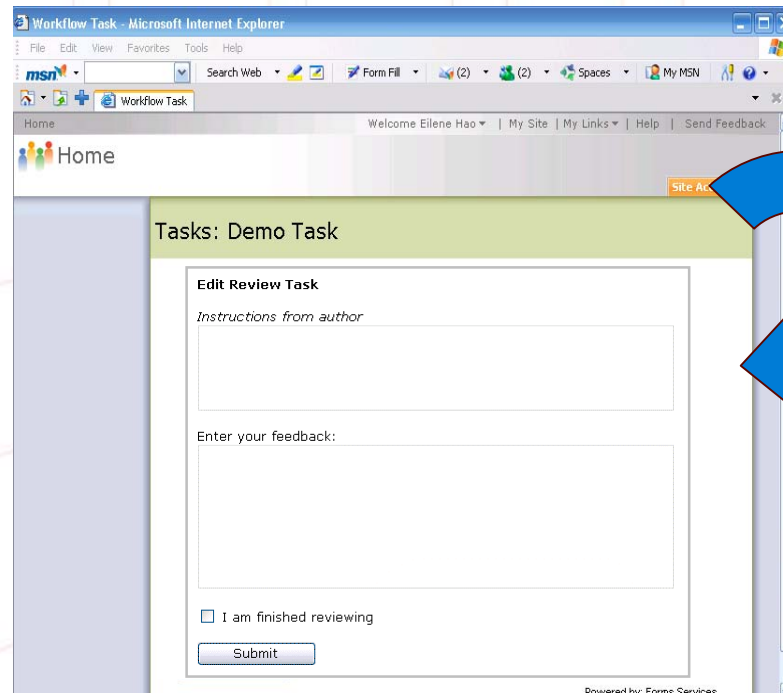
Open...

The AutoFormat feature

# Create And Bind InfoPath Forms

SharePoint hosts the InfoPath form

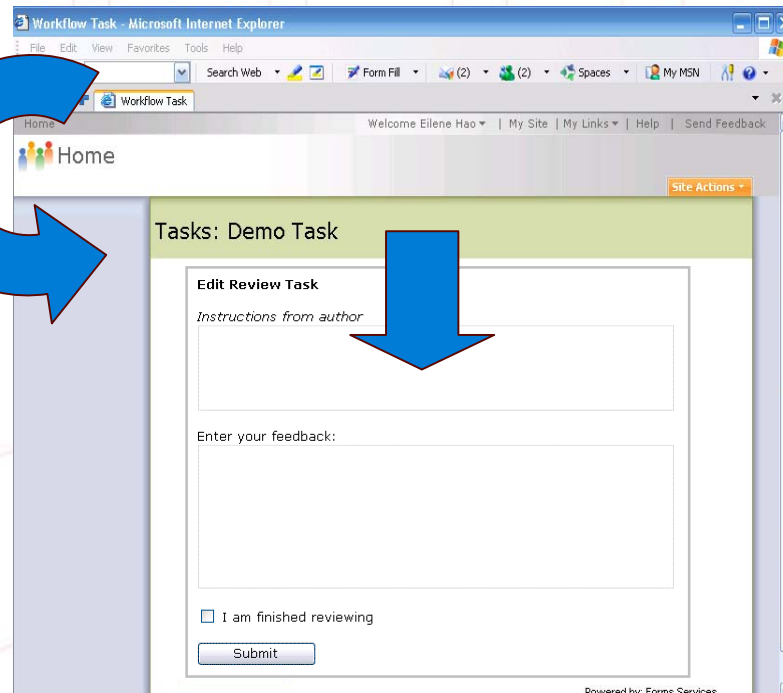
## Hosting Environment



# Create And Bind InfoPath Forms

Data from SharePoint is passed in

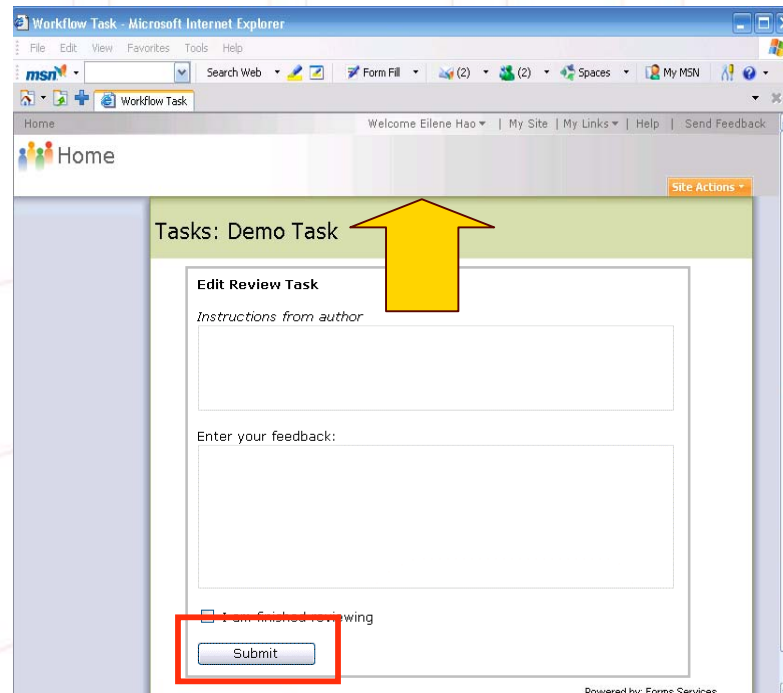
## Hosting Environment



# Create And Bind InfoPath Forms

## Submit the form, saves data to SharePoint

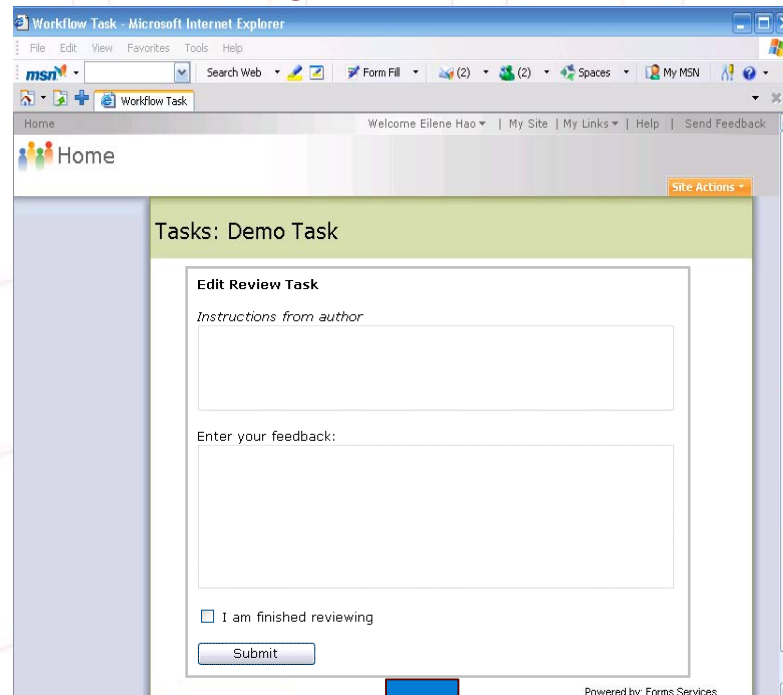
### Hosting Environment



# Create And Bind InfoPath Forms

## SharePoint starts the workflow

### Hosting Environment



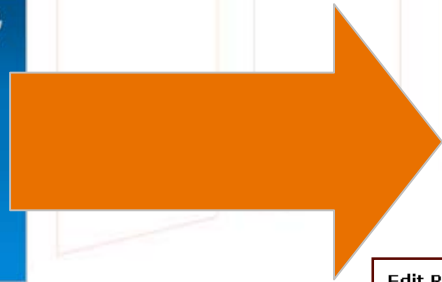
SharePoint -> Task/WF Host

# Create and Bind InfoPath Forms

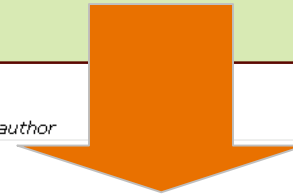
## Pushing data from WF task into IP

### SharePoint Task

•instructions =  
"Please do this."



Task data as xml  
*ItemMetadata.xml*



#### Edit Review Task

Instructions from author

```
<z:row xmlns:z="#RowsetSchema"
ows_instructions=""/>
```

I am finished reviewing

Submit

*InfoPath Task Form*

# Deploy To SharePoint Server

- Generate Metadata files
  - Feature.XML
  - Workflow.XML
- Create the CAB (WSP)
  - Box admin installs "WSP" file
- Install/activate the "feature"
- IISReset
- Associate workflow to the list/library

# Debug The Running Workflow

- Visual Studio running on server machine
- Open the workflow in Visual Studio
- Attach to all of the W3WP Processes
- Start the workflow

# Building The Workflow

# demo

# Recap – Steps involved

- Create Workflow project in Visual Studio 2005
- **Model the workflow**
- **Create and bind InfoPath forms**
- **Design workflow code and activities**
- Sign and compile the assembly
- Author the feature definition file
  - Add GUID
  - Add title
  - Add description
  - Add manifest location
- Author workflow template definition file
  - Add GUID
  - Add name
  - Add description
  - Add form URN's
  - Add assembly details extract the public key
- Run the post build event to deploy the workflow
- Associate the workflow to a list
- Attach to the W3WP.exe process and debug

# VSTO to make it easier

- Visual Studio tools for Office (VSTO) soon to be released
- Include new VS templates for SharePoint workflow
- Development steps with VSTO
  - Create workflow in Visual Studio Tools for Office
  - Design the actual workflow, add code etc. (This is the “real” developer task)
  - Press F5

# Thank you!

- Questions?