



SHAREPOINT DEVELOPMENT RECOMMENDATIONS

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1. ANNOTATION

This document is intended to describe approach to implementation of several development tasks for Windows SharePoint Services and Microsoft Office SharePoint Server. It also describes corresponding tips, important implementation details and risks. It is not a complete guide but several important topics are covered.

If you have further questions or remarks please send them to Elena Popretinskaya (Elena.Popretinskaya@gersis-software.com).

2. WORKFLOW DEVELOPMENT TASKS

Task	Description	Approach and tips	Efforts	Risks	Links
Processing event OnTaskCreated	In many cases it is necessary to implement some actions when Task created (e.g. notify user by email without usage of standard email)	<ol style="list-style-type: none"> Double-check that OnTaskCreated event is triggered for any count of tasks. <i>It is possible that OnTaskCreated event will work (will fire) for 1 task, for 2 tasks, but won't for 3 tasks.</i> If possible avoid this event because of its instability. The workaround for this event is usage of Event Receiver for event ItemAdded for Task Content Type or Task List of Workflow. 	<ol style="list-style-type: none"> It is necessary to implement Event Receiver for Task and also register it for Task Content Type or Task List instead of implementing one method for OnTaskCreated activity. To register Event Receiver you should use Object Model if possible (e.g. usage of Feature Receiver, or register it right at Workflow) because registering via CAML-file quite instable. 	<p>Sometimes this event is not triggered for all the tasks and even causes Workflow hanging.</p> <p>Usage of Event Receiver causes additional efforts since you need keep them up-to-date (reregister properly Event Receivers when implementation changes).</p> <p>Moreover it is harder to maintain Workflow because you need to remember not only about workflow itself but also about associated Event Receivers for Tasks</p>	<p>On Task Created doesn't fire...</p> <p>Workflow hang when starting two workflows in between short time period.</p>
Processing all		1. Be sure that all Task-related activities	You need to declare activity for each	Since Visual	

Task	Description	Approach and tips	Efforts	Risks	Links
task events		<p>(such as <code>CreateTask</code>, <code>CompleteTask</code>, <code>OnTaskChanged</code>, <code>OnTaskDeleted</code>, etc.) have the same Correlation Tokens</p> <p>2. Be sure that there are no duplicated tokens with the same name at <code>Workflowname.designer.cs</code>. <i>For example may have two tokens (<code>correlationToken1</code>, <code>correlationToken2</code>) with name "taskToken" and parent activity "taskSequence".</i></p> <p>Visual Studio produces such duplication when you are copy/paste your activities at Workflow designer. <u>It seems that events are not triggered properly when such duplicated tokens exist.</u></p> <p>3. Be sure that all workflow activities attached to the same task has the same TaskId property (the same one that is being bound to <code>CreateTask</code> activity)</p> <p>4. Be sure that all custom fields in your workflow/activity/event argument classes are serializable. Otherwise workflow engine may be not able to deliver your events properly.</p>	task event and task action and create appropriate handlers for your activities.	Studio provides pure supports for workflow configuration check most part of problems occurs only at Runtime environment. This causes risk to solution stability.	
Cancelation of the workflow	Sometimes you need to cancel	1. Cancelation of the Workflow should be implemented with help of Workflow	1. Declare new modification at <code>workflow.xml</code>	When you are finish the workflow	See SDK samples

Task	Description	Approach and tips	Efforts	Risks	Links
	<p>(not terminate) the workflow.</p> <p>The difference between cancelation and termination is following.</p> <p>Termination of a workflow deletes all the tasks associated to workflow. It also requires special permissions (you should have permission to manage the list where workflow is being used).</p> <p>Cancellation of Workflow is a business function that just finishes the workflow.</p>	<p>Modification.</p> <ol style="list-style-type: none"> Be sure that your EnableWorkflowModification activity and OnWorkflowModification activity have the same unique correlation token (you may call it "modificationToken") Place your EnableWorkflowModification activity to the same EventHanglingActivityScope you use for event processing of your tasks. Be sure that EnableWorkflowModification and OnWorkflowModified that handles the same modification (in this case – Workflow Cancelation) have the same ModificationId (the one you have declared at workflow.xml) <p><i>For example if at your workflow.xml you have declared modification</i></p> <pre><Modification_2cffa9d7-c7c7-4a71-9567-846239aa7e58_Name>Cancel the workflow</Modification_2cffa9d7-c7c7-4a71-9567-846239aa7e58_Name></pre> <p><i>You need to set ModificationId property of</i></p>	<ol style="list-style-type: none"> Declare your EnableWorkflowModification and OnWorkflowModified activity for this modification Declare UpdateAllTasks activity to set custom status to your workflow tasks If you want to finish the workflow immediately after cancelation (you don't want to wait while OnTaskChanged event will be triggered for every task of workflow) implement your custom Exception class and declare FaultHandler at EventHandlingActivityScope 	<p>by awaiting of every OnTaskChanged event triggered in result of workflow cancelation it is possible that OnTaskChanged events won't fire for all the tasks and it is risk for Workflow stability.</p>	<p>(Approval Workflow Sample).</p> <p>OnTaskChange is not running</p>

Task	Description	Approach and tips	Efforts	Risks	Links
		<p><i>EnableWorkflowModification and OnWorkflowModified to 2cffa9d7-c7c7-4a71-9567-846239aa7e58</i></p> <p>5. In order to set custom status to your workflow tasks use UpdateAllTasks activity.</p> <p>6. To cancel all tasks immediately you can use approach with exception. Just set the variables you need at OnWorkflowModification event processing method, throw you custom exception. Then create FaultHandler for your exception and use UpdateAllTasks activity to process task cancellation (e.g. set special task status to tasks)</p>			
Setting custom workflow status	When workflow finishes you need to set custom Workflow status (not the standard one e.g. Finished)	<p>1. Use SetState activity to change the standard workflow status.</p> <p>2. Don't use standard statuses at SetStatus activities.</p> <p><i>The reason – when you using standard statuses at SetStatus activity workflow engine fail with “Value does not fall in expected range” error by some reason.</i></p> <p>If you need to set the status of workflow to standard one just create your custom Status with the same name.</p>	<p>1. Declare SetState activity at your workflow</p> <p>2. Declare your custom statuses at workflow.xml</p> <p><i>For example:</i></p> <pre><ExtendedStatusColumnValues> <StatusColumnValue>Canceled by User</StatusColumnValue> <StatusColumnValue>Finished</StatusColumnValue> </ExtendedStatusColumnValues></pre> <p>3. Use the code similar to shown below at SetState handler:</p>	You need to duplicate standard statuses at your custom ones and it may cause inconsistencies in future.	Ready. Set. Workflow – Using SetState to Update Workflow Status

Task	Description	Approach and tips	Efforts	Risks	Links
			<pre> workflowStatus = Convert.ToInt32(workflowWasCa nceled ? SPWorkflowStatus.Max : SPWorkflowStatus.Max + 1); workflowStatus – variable that is bound to Status property of SetState activity. SPWorkflowStatus.Max corresponds <StatusColumnValue>Canceled by User</StatusColumnValue> SPWorkflowStatus.Max + 1 corresponds <StatusColumnValue>Finished</St atusColumnValue> </pre>		
Updating List Items and Documents at Workflow		<p>1. When updating Document at Workflow avoid errors caused by situations when document is checked out by User. Use <code>SystemUpdate(false)</code> method for this purpose.</p>	<p>Implement code similar to shown below if necessary:</p> <pre> SPSecurity.RunWithElevatedPrivil eges(delegate{ listItem[BSEU_DOC_STATUS] = BSEU_DOC_STATUS_IN_WORK; listItem.SystemUpdate(false); }); </pre>	<p>Workflow does not always change the value of Item Fields (e.g. we meet this issue for <u>read-only field</u>: <u>when document is checked out</u> field value is not being updated)</p>	<p>Update an SPListItem without having to check it out...</p>

3. EVENT RECEIVERS AND ITEM UPDATING TASKS

Task	Description	Approach and tips	Efforts	Risks	Links
Automatically change field value on Item Updating	In many cases it is necessary to implement automatic change of attribute of List Item or Document when some event occurs (e.g. automatically change the status of the document)	<ol style="list-style-type: none"> 1. You need to use Event Receiver for this purpose registered for List or Content Type. 2. If the field you need to change is visible at edit form change it at <code>ItemUpdating</code> event handler with help of <code>properties.AfterProperties["<FieldName>"]</code> 3. If the field you need to change is NOT visible at edit form change it at <code>ItemUpdated</code> event handler by changing list Item itself: <pre>public override void ItemUpdated(SPItemEventProp erties properties) { properties.ListItem[<FieldN ame>] = <Field Value>; properties.ListItem.SystemU pdate(false); //prevent additional Version incrementation }</pre> 	It is necessary to implement Event Receiver for Content Type and also register it for Task Content Type or List/Document Library. To register Event Receiver you should use Object Model if possible (e.g. usage of Feature Receiver, or register it right at Workflow) because registering via CAML-file quite instable.	Sometimes changing values via <code>properties.AfterProperties["FieldName"]</code> does not work. E.g. we found the situation when field that is not showing at Edit form is not changed by <code>ItemUpdating</code> event processor.	

Task	Description	Approach and tips	Efforts	Risks	Links
Reading DateTime fields on Item Updating/Item Adding event		<ol style="list-style-type: none"> Always check the format of DateTime field that comes to your event In some cases DateTime field values come to event in weird hex format (like "0x01c9874e 0x98f28800"). This seems to occur only on Office 2007 documents (for other file types, the value is a standard string format for a date). The article says that the hexadecimal value represents the number of ticks since the 1/1/1600. But in our project for me it was this number of ticks - 3 hours. So always check results of usage of workaround proposed. 	Implement date parsing with code similar to shown below: <pre>var published = properties.AfterProperties[DATE_PUBLISHED]; if (published == null) return; string dateString = published.ToString(); DateTime publishedDate; try { publishedDate = DateTime.Parse(dateString); } catch (FormatException ex) { //NOTE: For 2007 Office documents Workaround: publishedDate = new DateTime(long.Parse(dateString.Replace("0x", "").Replace(" ", "")), System.Globalization.NumberStyles.HexNumber).AddYears(1600).AddHours(3); }</pre>	This weird SharePoint behavior is undocumented and in future releases of SharePoint the meaning of this hex format can be changed.	SPListItem.Properties DateTime Fields are in weird Hex format
Update a Document from code without changing its version		<ol style="list-style-type: none"> Use <code>listItem.SystemUpdate(false)</code> method for this purpose. 	-	-	-

4. CONTENT TYPES DEFINITION TASKS

Task	Description	Approach and tips	Efforts	Risks	Links
Content Type definition schema	You need to create your own data structure to be used at your site.	<ol style="list-style-type: none"> 1. Use CAML to define new content types for your site. Content type is analogue of database schema for SharePoint therefore it is better to have definition file for this schema. 2. You should test your Content Type schema very carefully before usage in production. The reason: once this Content Type is being installed and activated there is no way to change existing Content Type it via CAML file. 3. If you want to change existing Content Type at production environment you should make it via UI or Object Model. Alternatively you can Define new Content Type and move old to hidden. Note: In <u>testing</u> environment you can delete Content Type you need to change (for this purpose you should be sure that there are no documents and custom child content types for Content Type you want to delete) and then reinstall it. 4. Alternatively you can keep existing Content Type and create new one with the same properties + new/changed properties. In this case out-of-date version of your 	<ol style="list-style-type: none"> 1. Define your new Content type at your CAML file 2. Define the feature that will be deployed to your site to install new Content type 	Since there is no way to change existing Content Type it via CAML file it produce additional efforts to keep Content Type schema up-to-date and sometimes it is hard to say is it actual or not.	Updating Content Types Content Type Deployment Using Features Content Type Feature with Document Template SharePoint - Provisioning a content type with CAML

Task	Description	Approach and tips	Efforts	Risks	Links
		content type should be moved to Hidden content types to avoid its future usage.			
Content Type Inheritance		<ol style="list-style-type: none"> Use Content Type inheritance to create a group of Content Types with the same nature Remember that all the changes made to parent Content Type have influence on their children. 	<p>To Create Content Type inheritance in CAML file define a Content Type ID for child type as</p> <pre><ParentContentTypeID>00<UniqueIDForYourChild></pre> <p><i>E.g. if you have parent Content Type</i> <i>0x010100D6B040</i> <i>DF31404711B830</i> <i>F12EF1259EEB</i> <i>for child content type ID can be</i> <i>0x010100D6B040</i> <i>DF31404711B830</i> <i>F12EF1259EEB00</i> <i>6B21807A72D848</i> <i>B9AE27B77DBB02</i> <i>3036</i></p>		SharePoint - Content Type ID's

5. INFOPATH FORMS DEVELOPMENT TASKS

Task	Description	Approach and tips	Efforts	Risks	Links
InfoPath Forms for Workflow	In many cases you need to set default values or initial values for your workflow.	<ol style="list-style-type: none"> When creating InfoPath form for Initiation and Association be sure you use the same data schema for Initiation/Association data in your Initiation and Association forms Do not forget to add <code>context.xml</code> data source to your form to make form Workflow enabled. Make sure that your form has at least Domain level security level. Better to use Full Trust security level. Otherwise Web-enabled forms can be inaccessible for users Do not forget to publish the form before you use it. 	<ol style="list-style-type: none"> Create form template at InfoPath. Introduce custom data validation and conditional formatting rules for form. In order to use form at your workflow specify corresponding form URNs at workflow.xml. In order to use Initiation/Association data at your code you should save Form templates as sources (<code><schemaName></code>) for saved xsd file with help of built in VS utility called <code>xsd</code>. 	<p>InfoPath form deployment to SharePoint (as well as any kind of deployment to SharePoint) does not informative enough. So even if you have got the errors during deployment you might not be able to see the reason or even to see them at all.</p> <p>So every time you update the form you should check if you are really working with actual version or not.</p>	<p>Создание XSN-форм для рабочих процессов (Workflow)</p> <p>Creating an association and initiation form in a workflow using VS.NET 2008</p> <p>How to: Configure a Contact Selector Control on Your InfoPath Workflow Form</p> <p>Workflow + InfoPath Forms. Form is not workflow enabled??</p>
Get User details at InfoPath form		<ol style="list-style-type: none"> Use Web Services functionality provided by SharePoint Be sure that link to Web Service is set on Site level not on Domain level. Otherwise 	<ol style="list-style-type: none"> Define new data source that obtains the data from Web Service. Use this data source for different validations at 	<p>Link to web-service at InfoPath form is hard-coded therefore every time you deploy solution to new site you should change the form itself with help of</p>	<p>InfoPath - Get the current user without writing code</p>

Task	Description	Approach and tips	Efforts	Risks	Links
		<p>users that don't have access to domain level site won't be able to work with a form receiving 5566 error</p> <p><i>For example incorrect approach is shown below</i></p> <p><i>http://sp:5231/_vti_bin/UserProfileService.asmx?WSDL</i></p> <p><i>correct one:</i></p> <p><i>http://sp:5231/sites/bseu/_vti_bin/UserProfileService.asmx?WSDL</i></p> <p>3. Check that security and network settings are configured properly for your site. The symptoms of incorrect settings are 5566 error that occurs during form opening. Check your <defaultProxy> Element (Network Settings) at web.conf file for site.</p>	<p>your InfoPath form.</p>	<p>InfoPath. Moreover in order to save the form you should connect to web-service. It means you should be able to change the form from PC on which target site is accessible and you should have permissions to access it. Such an approach is not scalable enough.</p> <p>Security and network settings configuration is non-trivial thing and causes troubles during usage of web-services since error messages are not informative enough</p>	<p>InfoPath 2007: Ошибка при доступе к источнику данных (5566)</p> <p>Resolving InfoPath 5566 Error</p>

6. OTHER TASKS

Task	Description	Approach and tips	Efforts	Risks	Links
Queries to Lists	In many cases you need to obtain list data by some criteria.	<ol style="list-style-type: none"> You need to use CAML queries for this purpose Use U2U CAML Builder or other tool to debug you queries. 	<p>You need to build your CAML query and execute it for list or site:</p> <pre>SPQuery yourList = someList; SPQuery query = new SPQuery{ ViewFields = string.Format(@"<FieldRef Name = {0}/><FieldRef Name ='{1}'/><FieldRef Name ='{2}'/>", <yourFieldNa me1>, <yourFieldName2>, <yourFieldName3>) }; query.Query = <yourCAMLQueryString>; yourList.GetItems(quer y;</pre>	Wrong queries do not throw any exception as a rule therefore it is possible to miss wrong query in your application if you don't check it good enough.	U2U CAML Builder
Changing visibility of menu items for standard List View	Sometimes you don't need all the items listed at Toolbar	<ol style="list-style-type: none"> There is no standard way (via site settings or feature deployment) to change content of standard toolbar menu (Create/Upload/Actions/Settings) for list item view. In order to hide menu items 	–	Since you need to use third-party or your own WebParts you should double-check their stability. When you are changing something standard with workaround it is always the risk since when implementation of	http://features.codeplex.com/

Task	Description	Approach and tips	Efforts	Risks	Links
	menu or you simply want to change their names	you should use custom third-party WebParts (such as Toolbar Manager) or write your own ones (containing scripts that hide page elements)		Standard elements changes it may cause faults for your workarounds.	
Editing content of ECB-menu (context menu for items)		<ol style="list-style-type: none"> There is no standard way (via site settings or feature deployment) to hide/change standard ECB menu items (Edit settings/View/Check Out/Check In, etc.) for list item view. In order to change ECB content you need use action features for deployment of your Custom menu items and you need change standard ECB rendering script if you want to modify standard ECB menu items 	In order to change ECB content you need use action features for deployment of your Custom menu items and you need change standard ECB rendering script if you want to modify standard ECB menu items	<p>Since you need to change standard menu rendering script it causes risks and lower maintainability.</p> <p>Moreover if you need to change ECB only for few lists for your site this approach greatly increase efforts that are necessary to implement this script since all the site pages use the same script for ECB rendering.</p>	How to: Hide a Menu Item in the ECB from SharePoint List Items
List Users from Active Directory (AD) group added to site		<ol style="list-style-type: none"> There is no standard way for SharePoint to list the users from AD group added to site. In Object Model AD group is represented with SPUser with property IsAdGroup = true. Possibly you should query AD group (e.g. query LDAP server) from your code in order 	–	You need to re-implement thing that is implemented already inside SharePoint. It causes additional risks to product maintainability since you should manage AD-connection settings at your code.	Adding users by group from AD Add users of an AD Group to the SharePoint Site

Task	Description	Approach and tips	Efforts	Risks	Links
		to retrieve all the users from AD group.			

7. ADDITIONAL INFORMATION

If you have some remarks we will appreciate if you let us know – that will allow us to improve this guide.

If you have further questions we would like to help you.

For technical matters please contact to **Elena Popretinskaya** (Elena.Popretinskaya@gersis-software.com).

To discuss possible cooperation please contact to **Igor Ustinov** (Igor.Ustinov@gersis-software.com).