

# **Deltek VisionXtend™**

## **Invoking a Web Service to Process Workflow Actions**

**Deltek Vision 6.1**

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## Overview

The Workflow feature in Vision is very comprehensive and offers the capability to set up a wide range of workflow criteria and corresponding actions. In order to extend the ability to define actions whose processing logic is beyond the scope of standard actions available in the application, and specifically if actions involve dealing with data or applications outside of Vision, Vision provides the ability to invoke a Web service when a set of workflow conditions are met.

The guidelines for using a Web service with workflows, along with sample code snippets, are included in this document.

## Invoke Web Service vs. Invoke Custom Method Options in Workflow

It is important to note the differences between these two options; please note that the use of Web services in workflow is suitable only under specific conditions.

### When to Use Web Services

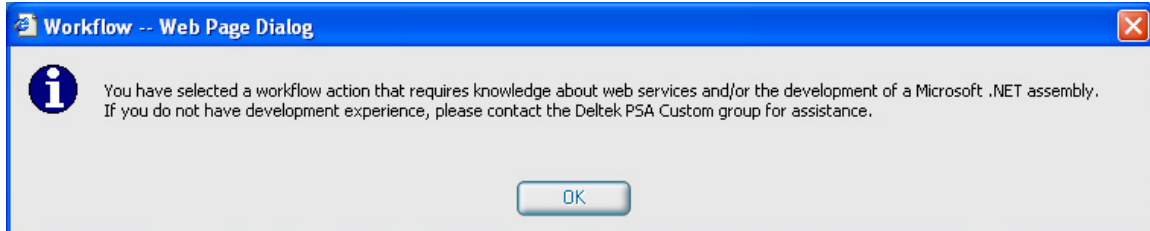
- Web services offer a standard way to leverage capabilities of different distributed applications that offer Web services, regardless of how they are built and where they are located.
- In the context of Vision, Web services are particularly suitable if a specific action needs to be triggered outside of Vision based on a specific event or set of events in Vision.
- Use Web services option if existing Web services offered by others vendors and applications need to be invoked based on workflow events in Vision.
- The Web service option is also applicable when the code that captures custom logic to handle Vision events cannot be on the Vision server and needs to reside at a different location on the Intranet or the Internet.
- If the action for a workflow event needs to access/modify data in Vision database, it is strongly recommended that you use Invoke Custom Method rather than Invoke Web Service. Using a Web service to access a Vision database will not allow your queries to be part of the Vision database transaction.

### Advantages of Using a Custom Method

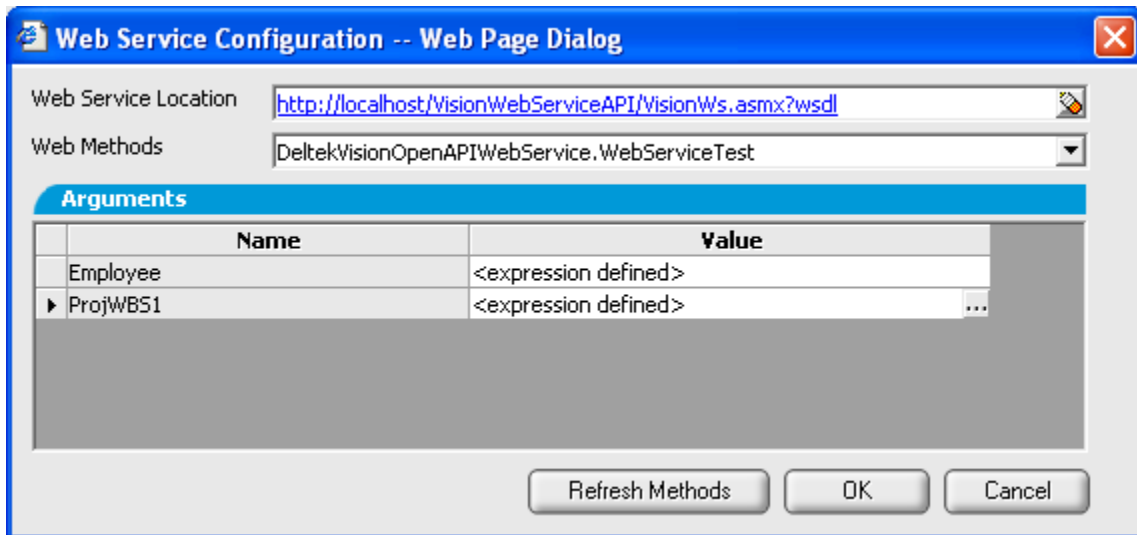
- Using a custom method from a custom DLL residing on the Vision application server has several advantages. For more technical details, see the document *Invoking a Custom Method to Process Workflow Actions*.
- The custom component/DLL used to invoke a custom method in workflow can inherit from Vision workflow API DLL, and the custom method can access some of the internal methods of Vision which includes methods to access Vision database. This is certainly an advantage and it also makes it easy to write code for the custom method.
- Any SQL access included in the custom method is handled as a part of Vision transaction.
- If the Save transaction fails in Vision, everything is rolled back including what was processed in the custom method.
- Since a Vision transaction is already open and available for use, there is no need to use a connection string to connect to Vision database from the custom method.
- Since the custom component (DLL) that consists of the custom method is local, it offers better performance, and avoids serialization and de-serialization of data which would be the case when remote Web services are used.
- The deployment is extremely simple as it involves copying of a single DLL to a specified location on the Vision server.

## Implementation Details

The **Insert** hyperlink on the Actions grid in Workflow area gives a list of action types to choose from, including Invoke Web Service. When this option is selected, Vision displays the following warning message.



When clicked on **OK**, the following dialog is displayed to collect required information about the particular Web service and the Web method to be invoked, and the parameters that need to be passed to the Web method from Vision.



### Fields on the Web Service Configuration Dialog

The following table describes the fields on the Web Service Configuration dialog.

Field	Description
<b>Web Service Location</b>	<p>This can be either a location or a file path for the WSDL file generated for the Web service, or it can be a URL to the WSDL file located on a Web server.</p> <p>For Web services written in ASP.NET, it can also be a URL to the Web service 'asmx' page with "?WSDL" added at the end. This parameter will generate WSDL information automatically. The following are some examples:</p> <p>WSDL File Location: <a href="\\Serv1\Share1\Proj1\VisionWorkflowWS.wsdl">\\Serv1\Share1\Proj1\VisionWorkflowWS.wsdl</a></p> <p>WSDL File URL: <a href="http://Serv1/VisionWorkflowWS/ VisionWorkflowWS.wsdl">http://Serv1/VisionWorkflowWS/ VisionWorkflowWS.wsdl</a></p> <p>ASMX page URL: <a href="http://Serv1/ VisionWorkflowWS / VisionWfWS.asmx?wsdl">http://Serv1/ VisionWorkflowWS / VisionWfWS.asmx?wsdl</a></p>

Field	Description
<b>Web Method</b>	Based on the information contained in the WSDL file, a list of available Web methods in the Web service is loaded into the dropdown. From the displayed list of Web methods, an appropriate method for Vision workflow is selected.
<b>Arguments</b>	The Arguments grid is automatically loaded with a list of arguments or parameters defined for the selected Web method. Each argument's name is listed on the left column of the grid. The value for each of the arguments is populated in the right column of the grid. The values for arguments must be provided using the SQL Expression Builder.

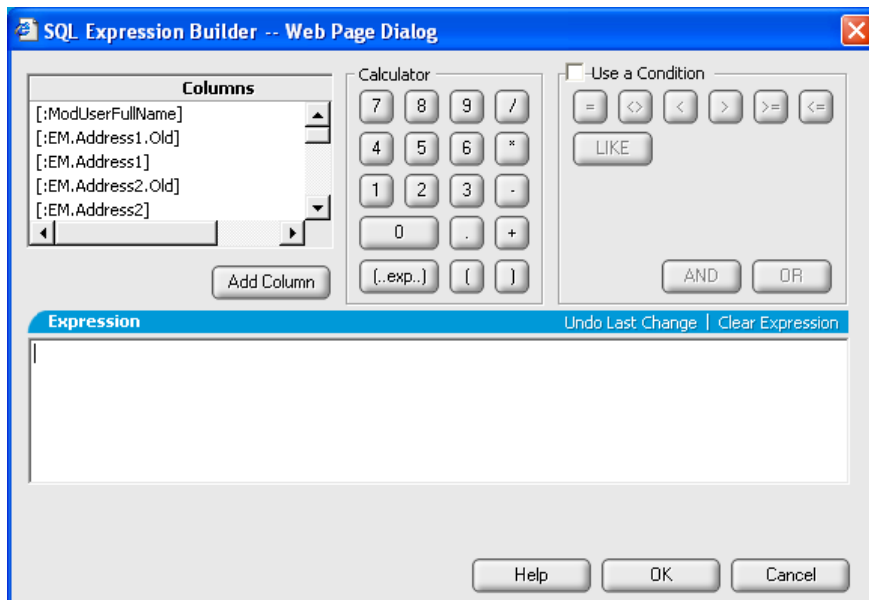
## SQL Expression Builder

The SQL Expression Builder is a powerful tool that enables users to build simple or complex SQL expressions using Vision database fields. The expression can be as simple as just the column name from a table in the database or it can be a complex SQL statement with various operators and conditions. The list of columns available for use is based on the workflow table selected for workflow. When the main record/table for the Info Center is selected as the workflow table, the list of columns includes columns from the main Info Center table and also any form type or grid type user-defined fields created for the Info Center.

All character/string type fields are added to the expression with qualifiers (single quotes) around them when **Add Column** button is used. All numeric type fields are added with no qualifiers.



The SQL expressions are not validated or evaluated when they are being built. Deltek recommends checking expressions for accuracy before saving them.





## Refreshing Modified Values

If the currently referenced Web service has been modified to include new Web methods or if existing Web methods have been altered with respect to the list of arguments, then you can use the **Refresh Methods** button on the Web Service Configuration dialog. Clicking on this button forces Vision to read from the latest WSDL file generated for the Web service, and the Web method dropdown is refreshed with latest values. If the list of arguments has changed for the Web method that is currently selected, the Arguments grid is automatically refreshed to reflect the change.

## Application Development Notes

The Web service is run when a record in the workflow table is saved in Vision. When the Web service is run, the transaction may be still pending depending on whether or not there are other tables that need be saved by Vision as part of the same transaction.

The processing of Web service is independent of successful completion of 'Save' transaction in Vision. If 'Save' transaction fails because of problems encountered while saving changes to other tables (after processing changes for the workflow table), the Save transaction is rolled back in Vision, however the Web service would have run and it cannot be rolled back.

The Web service (Web method) can return an XML string back to Vision so that a message can be displayed in Vision. The message can be of warning type or it can be an error. The format for return XML message is detailed below. If an empty string or empty error XML is returned, it means that there were no errors or warnings when the Web service was run.

### Error Message

```
<errors>
  <error>Error Message 1</error>
  <error>Error Message 2</error>
  <error>Error Message 3</error>
</errors>
```

Error messages 1, 2, and 3 are actual messages that will be displayed in Vision.

### Warning Message

Returned message can also be designated as warning rather than as error. An XML attribute 'warning' is used to indicate that the message returned is to be displayed as a warning in Vision. The XML format for warning messages is exactly the same as the format used for error messages but an extra attribute is used, as shown below.

```
<errors warning="y">
  <error>Warning Message 1</error>
  <error>Warning Message 2</error>
  <error>Warning Message 3</error>
</errors>
```

### Return Message to Indicate Successful Running of the Web Service

An empty string ("") or the following empty XML error message is returned.

```
<errors></errors>
```

