Oracle® Augmented Business Visualization for Agile Solution

White Paper

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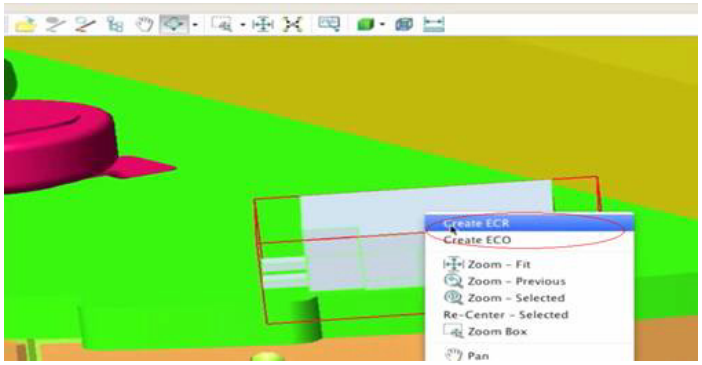
1 Introduction

This white paper describes the **A**ugmented **B**usiness **V**isualization (ABV) solution for Agile Product Lifecycle Management A9.3.3 and AutoVue 20.2.2.

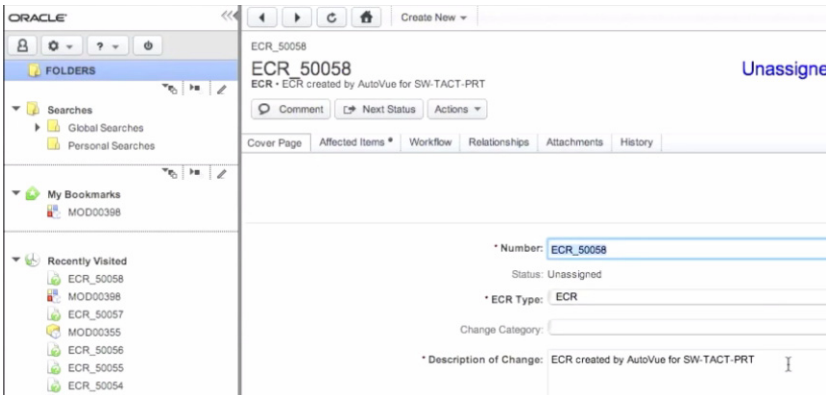
- The ABV solution extends Agile PLM by allowing users to create change objects, such as Engineering Change Request (ECR) and Engineering Change Order (ECO), directly from the viewing document (i.e. AutoVue).
- The solution enables the creation of change objects in Agile from AutoVue via an ABV integration. When a user right-clicks a part in a 3D model in AutoVue, options are listed to create various change objects (which the user has privileges to create) such as Create ECO or Create ECR.

Figure 1 3D model in AutoVue



- When the user selects one of these options, the change object is automatically created in Agile, and both the selected part and the top level assembly are added as affected items on the change object. The user's Agile window automatically switches to the page for the newly created ECR.

Figure 2 Agile window



2 Definitions

- Augmented Business Visualization: A visualization framework which provides rich and actionable visual decision making environments by connecting portions of documents to business data found in Agile A9 enterprise application.
- Hotspot: A particular portion of a model that is made active as part of an ABV solution. That is, you can change the color of the hotspot to indicate certain information, and can trigger actions by clicking or right-clicking on the hotspot.
- Process Extensions (PX): A framework that enables Agile PLM customers to extend the functionality of Agile PLM. The functionality can be server-side extensions, such as custom workflow actions and custom auto numbering, or extensions to client-side functionalities, such as external reports, or new commands added to the Actions menu or the Tools menu. These PXs are implemented using the Java programming language.

3 Technical Overview

As a brief overview of AutoVue's Hotspot mechanism, AutoVue provides a mechanism to turn all 3D parts that contain a specific attribute into a hotspot. When the user right-clicks on that hotspot, additional options are automatically added to the top of the right-mouse button menu based on the hotspot configuration. If the user selects any of these objects, a callback is invoked and is passed the menu item that the user selected as well as information on the clicked object.

This mechanism is used to add the Create ECR style options to the right-mouse button menu in AutoVue (querying Agile to determine which objects the current user can create). The callback then invokes the appropriate code to create the change object and switch the Agile UI to display the newly created object.

4 AutoVue PX

The AutoVue PX does the following:

> **Note:** The AutoVue PX does not need to be modified for normal operation. However, if it is required to change the way attributes in AutoVue are mapped to the affected parts in Agile, the PX will need to be modified. For more information, refer to "Configure abv.properties".

- Validates which change objects the user has privileges to create.
- Defines all the other parameters needed to initialize the hotspot framework.
- Customers/partners can change which objects are available or which attributes are used to define hotspots.
- Sets the localization of strings such as Create ECR that appears in the RMB menu.
- Based on the information passed to the PX, it determines the following:
  - Type of change object to create.
  - Which parts to attach to the Affected Items tab.
- Creates the change object, finds the affected parts, and adds them to the Affected Items tab on the newly created object.
- By default, if a part has pending changes, a new change can be created for this part without any warnings. This is a result of disabling warning messages regarding pending changes. For more information, refer to "Configure abv.properties".

> **Note:** Agile Web Client triggers a popup when there is an attempt to create a change on a part that already has pending changes. This pop-up asks the user whether it should continue to create the new change or cancel it. However, the ABV for Agile does not have UI interaction through a popup and has a static behavior that is controlled by the CreateChangeWarnings option. This option allows the user to select the required behavior on parts with pending changes. For more information, refer to "Configure abv.properties". By default, it is set to allow the user to create new changes on parts with pending changes. If it is disabled, the user will receive an error message such as “Failed to create Change, Part P0001 is already on pending Changes C0001, C0002,… (Error code:xxxx)”

5 Configure abv.properties

The abv.properties file defines the list of properties that control the behavior of the AutoVue PX. Following is the default list of properties defined in the abv.properties files:

```
# Change list
ChangeList=ECO,ECR
# Agile part number attribute name
PartNumberAttributeName=AGILEID, Agile9 Document Number
# Part description attribute name
PartDescriptionAttributeName=PRT_DES
# ExceptionConstants.APDM_PENDINGCHANGE_ITEM_WARNING=568
CreateChangeWarnings=568
```

- ChangeList - This property defines the list of change objects that are available when the user activates the hotspot. If the user does not have the privilege to create a change, the change is filtered out from the list without any warnings.
- PartNumberAttributeName - This property defines the attribute name that corresponds to the Agile part number. If different CAD connectors are used, you can list the attributes names separated by a comma(,).
- PartDescriptionAttributeName - This property defines the part description attribute name.
- CreateChangeWarnings - This property defines the list of warnings that need to be disabled during change object creation. For example, if an item has pending changes and the user wants to create another change object, the creation will fail if the related warning (i.e. 568) is not disabled.

6 Installation Prerequisites

Before installing the Agile ABV, you must ensure the following prerequisites have been met:

- Agile 9.3.3 is installed.
- Oracle AutoVue for Agile Release 20.2.2 is installed.

> **Note:** Oracle AutoVue for Agile is not included with Agile and must be installed separately.

- 3D projects have been uploaded via a CAD connector.
- The user must have permissions/privileges to create ECRs and/or ECOs. The ABV solution only displays the options in the right-click menu button if the user is authorized to create the change object. For example, if a user can create an ECO, but not an ECR, only the Create ECO menu item is displayed.
- The solution requires that the data model is checked-in by the CAD connector and the CAD connector is configured such that the part, design and CAD file name all have the same name.

7 Installation

To install the ABV sample, place the abvpx.jar (AutoVue PX) in the %AGILE_HOME%/integration/sdk/extension folder. No other configurations or administration tasks are required.

8 Customization

To extend the function of ABV, all customizations must be done in the AutoVue Process Extension code. Note that the user must have appropriate user permissions in order to modify this PX.

To define the list of change objects that can be created using this solution:

- Prepare the ABV source code by updating the build script (see the provided README file). The code is located in %AGILE_HOME%/integration/sdk/samples folder.
- Edit abv.properties file and update the ChangeList property to reflect the new list of changes.
- Recompile the ABV sample code by running the build.bat batch script and replace the old abv.jar by the new jar. For more information, refer to "Installation".

By default, the solution allows users to create ECR and ECO change objects (ChangeList=ECO,ECR).

9 Using Different Data Models

The section provides information on how to use different data models with the ABV solution.

9.1 Changing the Part Number Attribute Name

As mentioned previously, the solution assumes that the CAD file name is equal to both the design object name and part object name. By default, the solution uses AGILEID (used for Pro/ENGINEER/Creo) and Agile9 Document Number (used for SolidWorks) as the part number attribute name from which it extracts the necessary information as defined in the abv.properties file (that is, PartNumberAttributeName=AGILEID,Agile9 Document Number). If your data model uses another part number attribute name, do the following:

- Prepare the ABV source code by updating the build script (see README file). The source code is located in %AGILE_HOME%/integration/sdk/samples folder.
- Verify that the value of PartNumberAttributeName in the abv.properties file contains the Agile9 Document Number. If not, you must add it as a part of the comma-separated list (that is, PartNumberAttributeName=AgileID, Agile9 Document Number).
- Compile the sample and replace the abv.jar by the new one. For more information, refer to "Installation".

To support multiple formats at a time, where each format uses a different part number attribute name, you can either append the new attribute value to the PartNumberAttributeName entry in the abv.properties file as stated above or configure a property mapping in the CAD connector. Doing so ensures that all formats use the same part number attribute name. For more information, consult the *Agile*

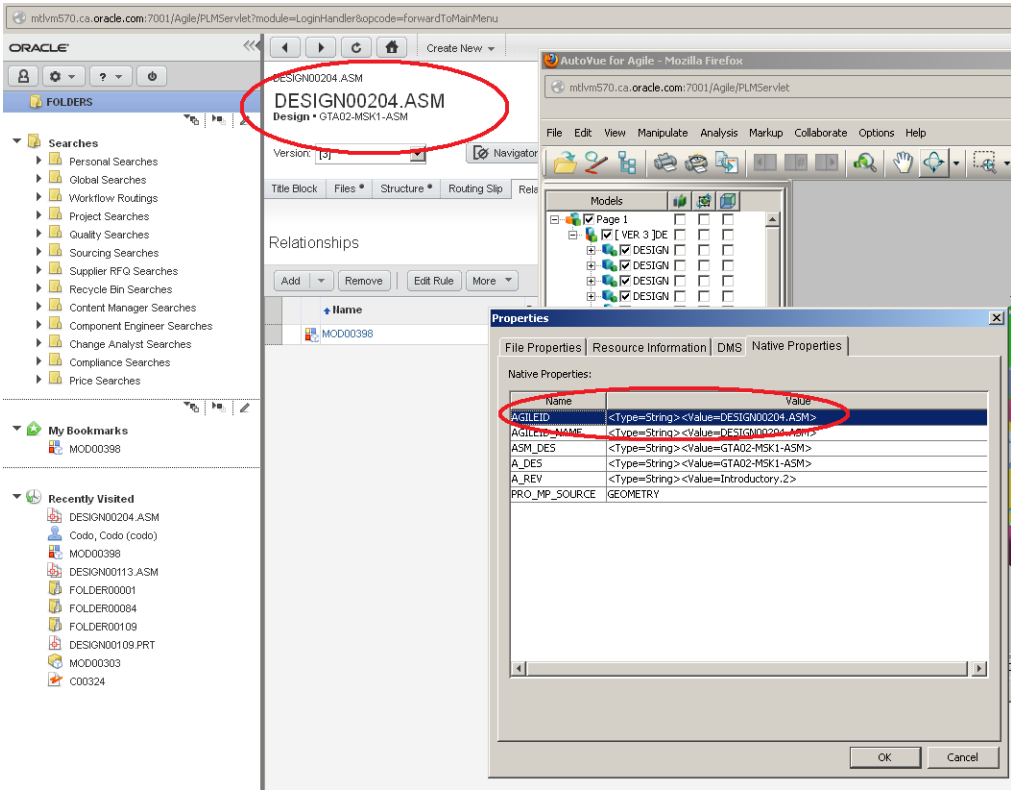
MCAD Connectors for Agile Engineering Collaboration User Guide located on the Oracle Technology Network (OTN) at http://docs.oracle.com/cd/E48127_02/otn/docset.html.

9.2 Changing the Part Object Look-up Algorithm

If the data model used does not satisfy the condition of the default data model (that is, the CAD file name equals both the design object name and part object name), you must adapt the solution for your data model. To do so, you must modify the doAction() method in the CreateChange.java source file to implement the following algorithm for your data model:

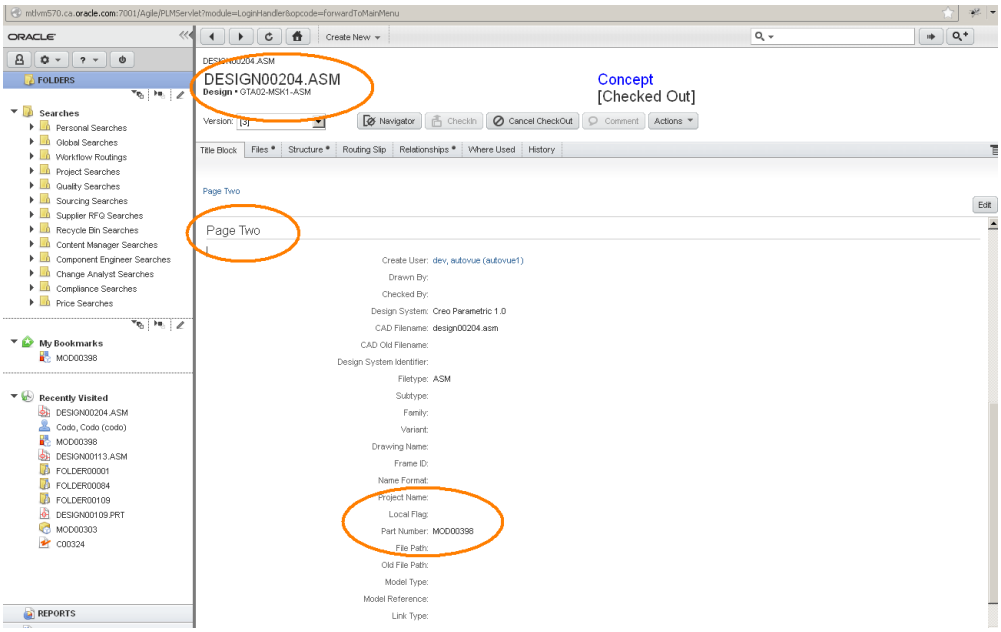
1. Retrieve the part number attribute given by the value of the PartNumberAttributeName property in abv.properties.
2. From this property, extract the CAD file name.
3. Use the CAD file name to retrieve the corresponding design object.

Figure 3 Identifying the CAD file name



4. From the design object, retrieve the title block object.
5. From the title block object, retrieve the Page Two object.
6. From the Page Two object, retrieve the Part Number attribute.
7. Use the Part Number attribute to retrieve the part object.

Figure 4 Retrieving the Part Number attribute.



For more details on the Agile SDK, please refer to the *SDK Developer Guide - Using Agile APIs* and *SDK Developer Guide - Developing PLM Extensions* documents on the Oracle Technology Network (OTN).

Once the changes are made, compile the sample and replace the abv.jar. For more information, refer to "Installation".

10 Limitations/Constraints

The following limitations apply to the ABV for Agile solution:

- AutoVue for Agile does not notify the user whether the ABV for Agile solution is enabled or not.
- AutoVue for Agile does not move to the front of the Agile client once the change is created.
- The PX code does not check if the current viewed file is an older version. That is, if an older version of a file is viewed and a user creates a change object, it will be associated with the latest version of the viewed file.
- The description of change is optional in the ABV for Agile solution. If for any reason the PX code cannot add the description (for example, description max length exceeded), the change is created without the description and no error message is displayed to the user.
- The following limitations prevent the ABV for Agile solution from working on SolidWorks assemblies:

  a. Loading an assembly in MESH mode: AutoVue for Agile does not support custom attributes for inserted components (parts and sub-assemblies). In this case, only the root assembly supports custom attributes.

  b. Loading an assembly in BREP mode: AutoVue for Agile loads the MESH data stored in the root assembly if the root assembly contains missing parts or

sub-assemblies. In this case, AutoVue does not support the custom attributes of the missing components.

c. Loading an assembly in BREP mode: AutoVue for Agile loads the MESH data stored in the root assembly if a component is loaded from a different configuration than the default. In this case, AutoVue does not support the custom attributes of the components that have a different configuration than the default.

Note: In limitations a through c, the user can only create ECR/ECO on parts or sub-assemblies that have attributes, and cannot create ECR/ECO for parts/sub-assemblies that are loaded in MESH mode by an ancestor. Rather, it can only create ECR/ECO on that specific ancestor.

For example, when a whole model is loaded in MESH mode, the user can only create ECR/ECO on the root (parent) assembly even if the part or sub-assembly is selected.

- Part XREFs are not included in AutoVue for Agile when an assembly is checked out. As a result, AutoVue for Agile loads the assembly files in MESH mode. That is, AutoVue for Agile does not support custom attributes for inserted components (parts and sub-assemblies). Custom attributes are only supported on the root (parent) assembly.

11 Documentation Accessibility

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