Using HL7 RMIM Designer with Visio 2002, 2003 & 2007

1 Introduction

Effective with RMIM Designer Release 4.3.3, it is possible to use this HL7 static model design with four releases of Microsoft Visio – 2000, 2002, 2003 & 2007 – and to share designs between users of these tools.

As users will be aware, the realization of an RMIM Designer in Visio 2003 stalled for over three years owing to incompatibilities introduced into the file format and changes to the underlying Visio software when Microsoft introduced Visio 2003. When first tested, users observed three effects

1. the drawings were badly messed up – all content appeared to have been lost from the "arrow classes", the "other classes" and "miscellaneous associations"
2. Although the software appeared to run, it reported errors and failed to validate designs that were known to be correct in Visio 2002
3. As a consequence of 2, designs could not be saved to the repository
4. Shape "checking" in Visio 2003 reported that drawing shapes were not drawn from valid stencil masters.

Any one of these issues would have been daunting to volunteers with limited time. In aggregate, they discouraged anyone from tackling them until the frustration level got high enough to allow it to overcome temerity. The final result required: software changes to the HL7 code; dynamic (during conversion) additions to shape data; alterations in the shape "checking" strategy; etc.

This software has been tested, but needs "proof in practice" to certain there are no residual errors. Hence, it has been listed as an ALPHA release for use with Visio 2003 and Visio 2007.

2 Preparation for RMIM Designer use

2.1 Release file formats and compatibility

Visio 2000 and Visio 2002 share a common file format (for the Visio "vsd" drawing files), and Visio 2003 and Visio 2007 also have a common format. The format change between the Visio 2000/2 format and the Visio 2003/7 format requires special processing in order to assure that no design elements are lost and that the design shapes are properly displayed in Visio 2003 or Visio 2007. This processing is discussed below. As importantly, the file conversions in **each direction** must be done in Visio 2003 (or 2007), not in Visio 2002.

2.1.1 Determining Visio Format for a Drawing File

For software purposes, the document "Category" property was adopted to capture the Version of Visio in which the file was saved. (This property can be viewed from **Menu File…Properties…Summary tab**, or by right-clicking on a file in Windows Explorer, selecting **Properties…Summary tab**.) This property is correctly set whenever a batch conversion is performed from one version to the other. It is also properly set for the conversion of single files from Visio 2002 to Visio 2003, but it is not properly set when a single file is reverted to Visio 2002 using the **File…Save** menu. The property will be correctly set the first time the file is opened in Visio 2002 and re-saved.
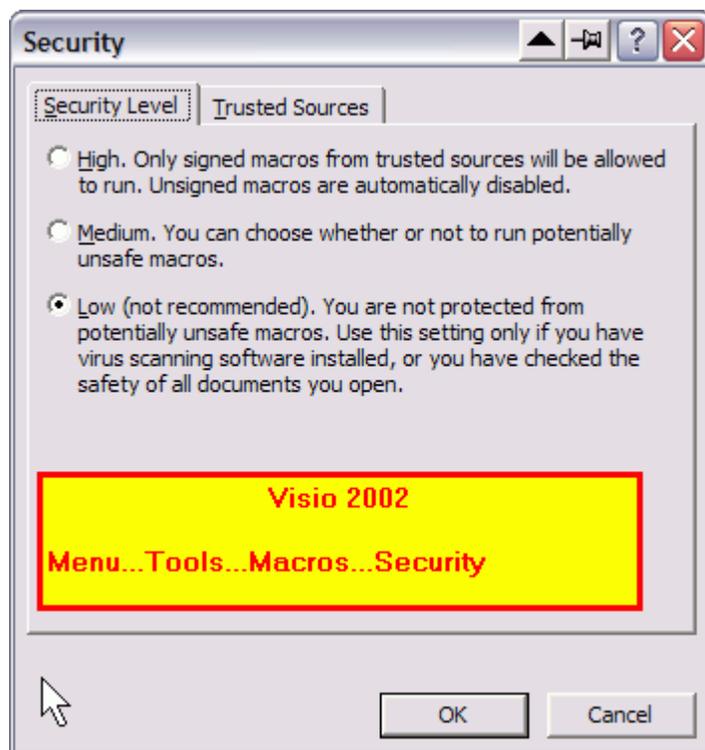
2.2 "Setup" of Visio for use with HL7 RMIM Designer in each Visio release

In order to prepare the Visio software for use with the HL7-provided RMIM Designer package, one must pre-set the correct Security and software enabling options in the installed package. With one exception (listed below), users of Visio 2002 probably have already set the correct options. New users of Visio 2003 and Visio 2007 should make the settings below.

Note that although the software formats are compatible, setup options differ between 2003 and 2007. This arises primarily because Office 2007 is designed fro Windows Vista and uses the Vista **"Trust Center"** to manage security functions that previously were set on an application-by-application bases.

2.2.1 Visio 2002 Setup

The following two images show the "Options" settings and the "Macro Security" settings, respectively. The Yellow box on each image details the Menu selections needed to get to the displayed dialog. The Dialog selections are those recommended for use with the RMIM Designer. The element that is **exceptional** in that Visio 2002 users may not have previously checked it is the "**Run in developer mode**" option, which should be enabled.

Options

General | View | Save | Regional | Spelling | File Paths | Advanced

User settings
- ☐ Record actions in Microsoft Outlook journal
- ☐ Put all settings in Windows registry

Developer settings
- ☑ Enable Microsoft Visual Basic for Applications
- ☑ Enable Visual Basic for Applications project creation
- ☑ Load Visual Basic for Applications projects from text
- ☐ Enable COM add-ins
- ☑ Enable Automation events
- ☑ Run in developer mode

Visio 2002

Menu...Tools...Options...Advanced

Freeform drawing

	Tight	Loose	Value
Precision:			5
Smoothing:			5

OK | Cancel

Security

Security Level | Trusted Sources

○ High. Only signed macros from trusted sources will be allowed to run. Unsigned macros are automatically disabled.

○ Medium. You can choose whether or not to run potentially unsafe macros.

◉ Low (not recommended). You are not protected from potentially unsafe macros. Use this setting only if you have virus scanning software installed, or you have checked the safety of all documents you open.

Visio 2002

Menu...Tools...Macros...Security

OK | Cancel

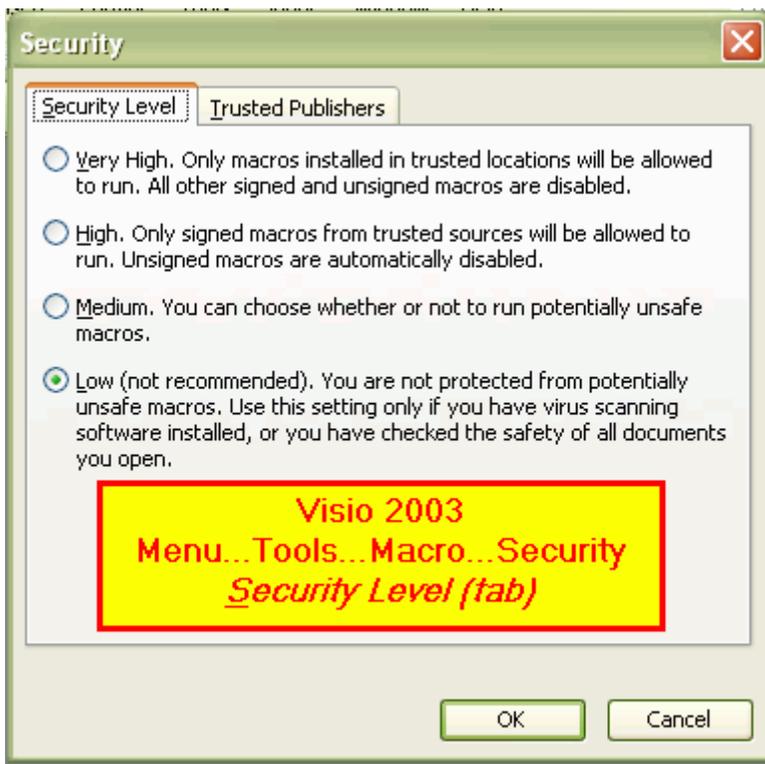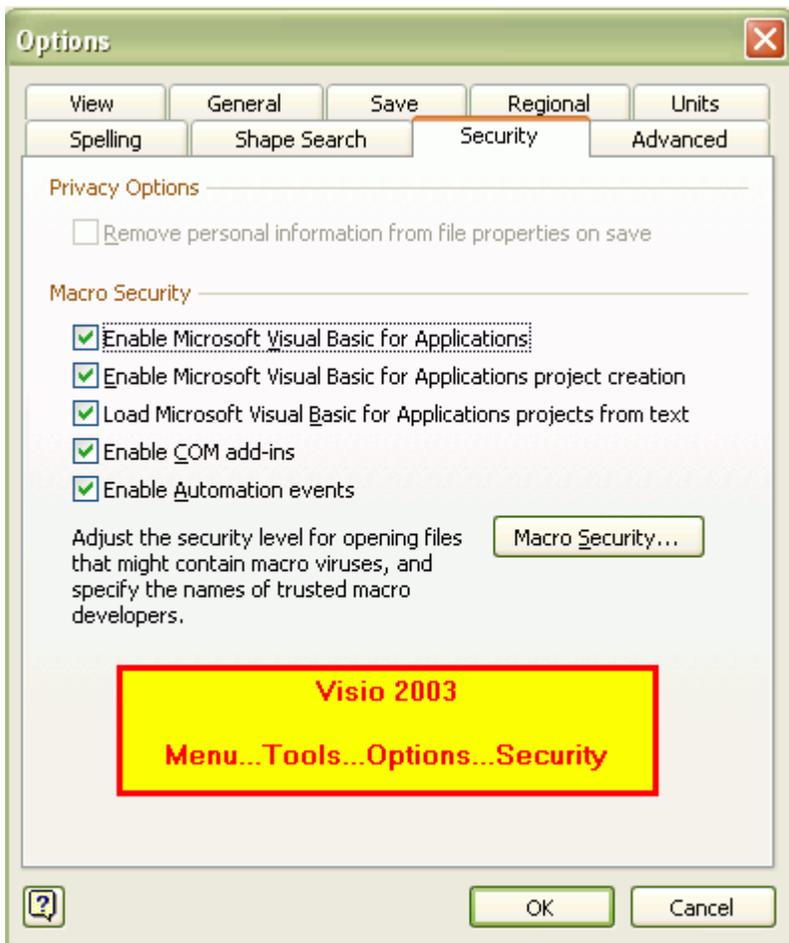## 2.2.2 Visio 2003 Setup

The following three images show the two different "Options" settings and the "Macro Security" settings for Visio 2003, respectively. The Yellow box on each image details the Menu selections needed to get to the displayed dialog. The Dialog selections are those recommended for use with the RMIM Designer.

Options

View	General	Save	Regional	Units
Spelling	Shape Search	Security		Advanced

Privacy Options

☐ Remove personal information from file properties on save

Macro Security

☑ Enable Microsoft Visual Basic for Applications
☑ Enable Microsoft Visual Basic for Applications project creation
☑ Load Microsoft Visual Basic for Applications projects from text
☑ Enable COM add-ins
☑ Enable Automation events

Adjust the security level for opening files that might contain macro viruses, and specify the names of trusted macro developers.

[Macro Security...]

Visio 2003

Menu...Tools...Options...Security

[OK] [Cancel]

Security

Security Level	Trusted Publishers

○ Very High. Only macros installed in trusted locations will be allowed to run. All other signed and unsigned macros are disabled.

○ High. Only signed macros from trusted sources will be allowed to run. Unsigned macros are automatically disabled.

○ Medium. You can choose whether or not to run potentially unsafe macros.

⦿ Low (not recommended). You are not protected from potentially unsafe macros. Use this setting only if you have virus scanning software installed, or you have checked the safety of all documents you open.

Visio 2003
Menu...Tools...Macro...Security
Security Level (tab)
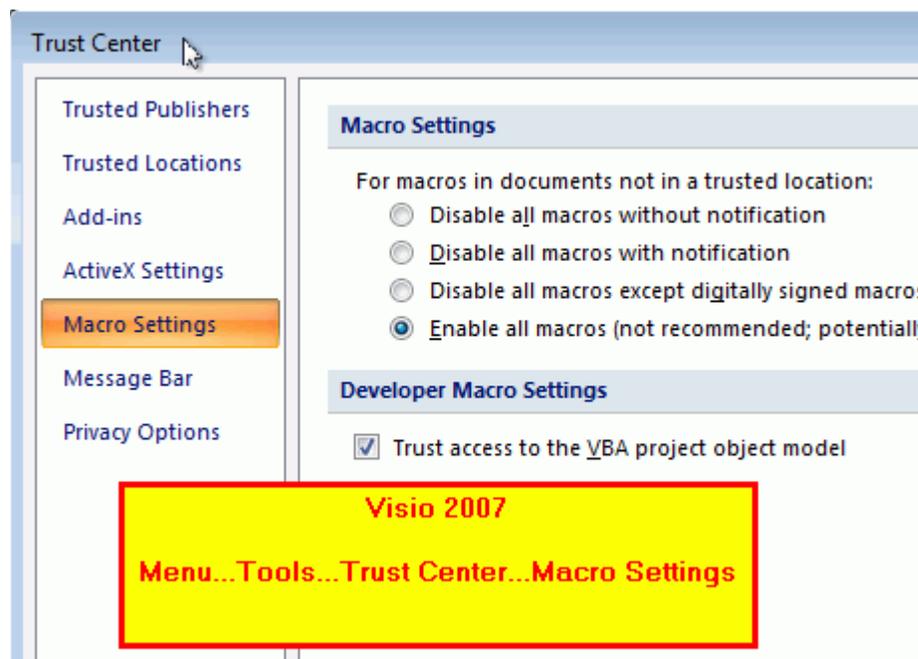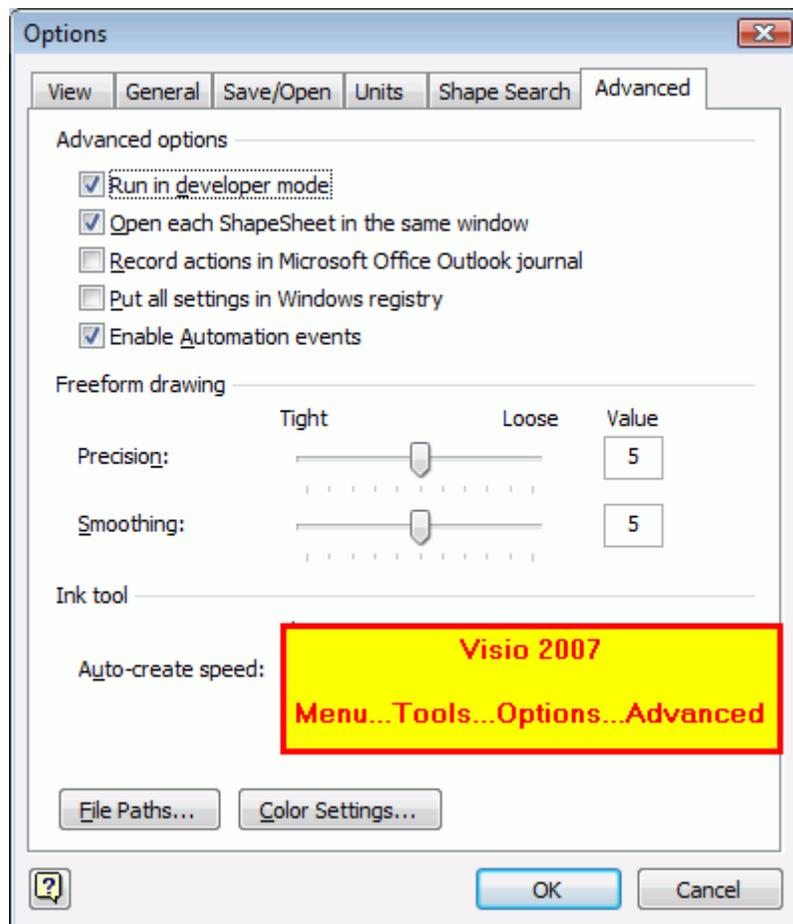
[OK] [Cancel]

2.2.3 Visio 2007 Setup

The following two images show the "Options" settings and the "Trust Center Macro Settings" settings for Visio 2007, respectively. The Yellow box on each image details the Menu selections needed to get to the displayed dialog. The Dialog selections are those recommended for use with the RMIM Designer.

Options ☒

View | General | Save/Open | Units | Shape Search | Advanced

Advanced options

☑ Run in developer mode
☑ Open each ShapeSheet in the same window
☐ Record actions in Microsoft Office Outlook journal
☐ Put all settings in Windows registry
☑ Enable Automation events

Freeform drawing

	Tight	Loose	Value
Precision:	——●——		5
Smoothing:	——●——		5

Ink tool

Auto-create speed:

Visio 2007

Menu...Tools...Options...Advanced

[File Paths...] [Color Settings...]

[?] [OK] [Cancel]

Trust Center ▷

Trusted Publishers
Trusted Locations
Add-ins
ActiveX Settings
Macro Settings
Message Bar
Privacy Options

Macro Settings

For macros in documents not in a trusted location:

○ Disable all macros without notification
○ Disable all macros with notification
○ Disable all macros except digitally signed macros
◉ Enable all macros (not recommended; potentially

Developer Macro Settings

☑ Trust access to the VBA project object model

Visio 2007

Menu...Tools...Trust Center...Macro Settings

3   Installation of RMIM Designer

3.1   Standard (or default) installation locations with each Visio release

Just as the file formats and the dialog formats have changed with various Visio releases, so too have the preferred location for storing user-specific Stencils for use with Visio. In each case, the "***RMIM Designer Installer***" used to complete the installation of the HL7 RMIM Designer identifies the Visio release being used and proposes the correct default installation programs. Moreover, in Visio 2003 & Visio 2007, it also records this information in the Visio…Tools…Options…Advanced menu dialog. The three default locations are listed below, where "UserName" is the users identity on the XP or Vista system in question:

- o   Visio 2002:
    `C:\Program Files\Microsoft Office\Visio10\1033\Solutions\HL7`
- o   Visio 2003:
    `C:\Documents and Settings\UserName\My Documents\My Shapes\HL7`
- o   Visio 2007:
    `C:\Documents and Settings\UserName\Documents\My Shapes\HL7`

3.2   Installing HL7 RMIM Designer tools with each Visio release

The RMIM Designer is released as a "Windows Installer" ("msi" file) for execution in windows. The installation is a two-step process for all Visio versions.

1. The initial step installs a widget named "RMIM Designer Installer." This small program is installed, along with all the necessary Visio support files in a standard "HL7/RMIM Designer" set of directories.
2. Once installed, the "RMIM Designer Installer" is itself run to actually build the directories in which Visio will find the material it uses to run the RMIM Designer.

3.2.1   Steps for Visio 2002 & Visio 2003 Installation

1. For these versions, running on Windows XP, the "msi" installer can be used directly, and will, by default, install the RMIM Design installation files in directory
    "`C:\Program Files\HL7\RmimDesignInstall`"
2. When the RMIM Designer Installer is run, it will select the target installation directories identified above. When complete, the "FilePaths" will have been updated in the Visio application. These can be viewed in Visio as in the following drawing:
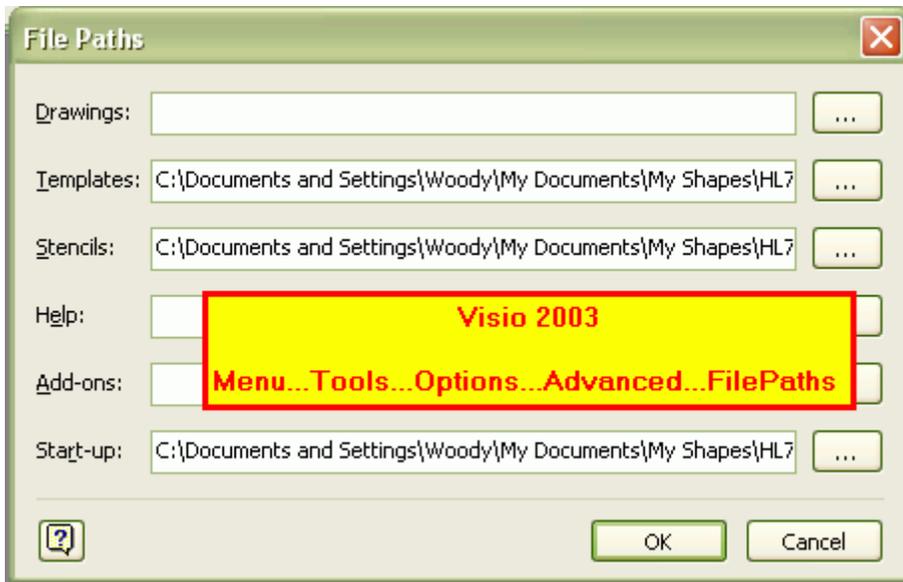
### 3.2.2 Steps for Visio 2007 Installation

0. By and large Visio 2007 will be encountered running under Windows Vista, and these instructions are based on a Visio 2007/Vista combination. In this environment, the user must have first installed "`HL7ToolsVistaInstaller.exe`" that is available form Gforge. This widget is used to install **all** HL7 tools in the Vista environment.

1. Use the HL7ToolsInstaller to execute the RMIM Designer "msi" file. This will install the RMIM Design installation files in directory "`C:\HL7Programs\HL7\RmimDesignInstall`"

2. When the RMIM Designer Installer is run, it will select the target installation directories identified above. When complete, the "FilePaths" will have been updated in the Visio application. These can be viewed in Visio as in the following drawing:
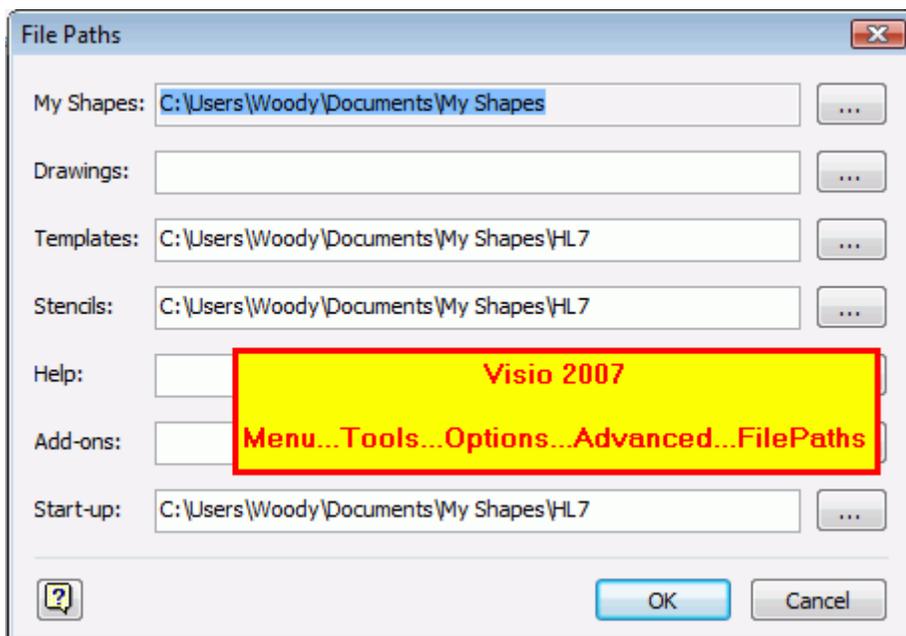
3.3 Selecting "New" RMIM drawing in each Visio release

Once the initial installation is complete, starting Visio should expose the option to create a "new" **RMIM2** drawing as part of the opening dialog. The appearance of these startup displays in the three different releases follows. Note that to date, we have been unable to determine how to change the "Other" category displayed in Visio 2003 and Visio 2007 to include an "HL7" subset, even though the Shape directories include the "HL7" sub-directory.

3.3.1 Visio 2002
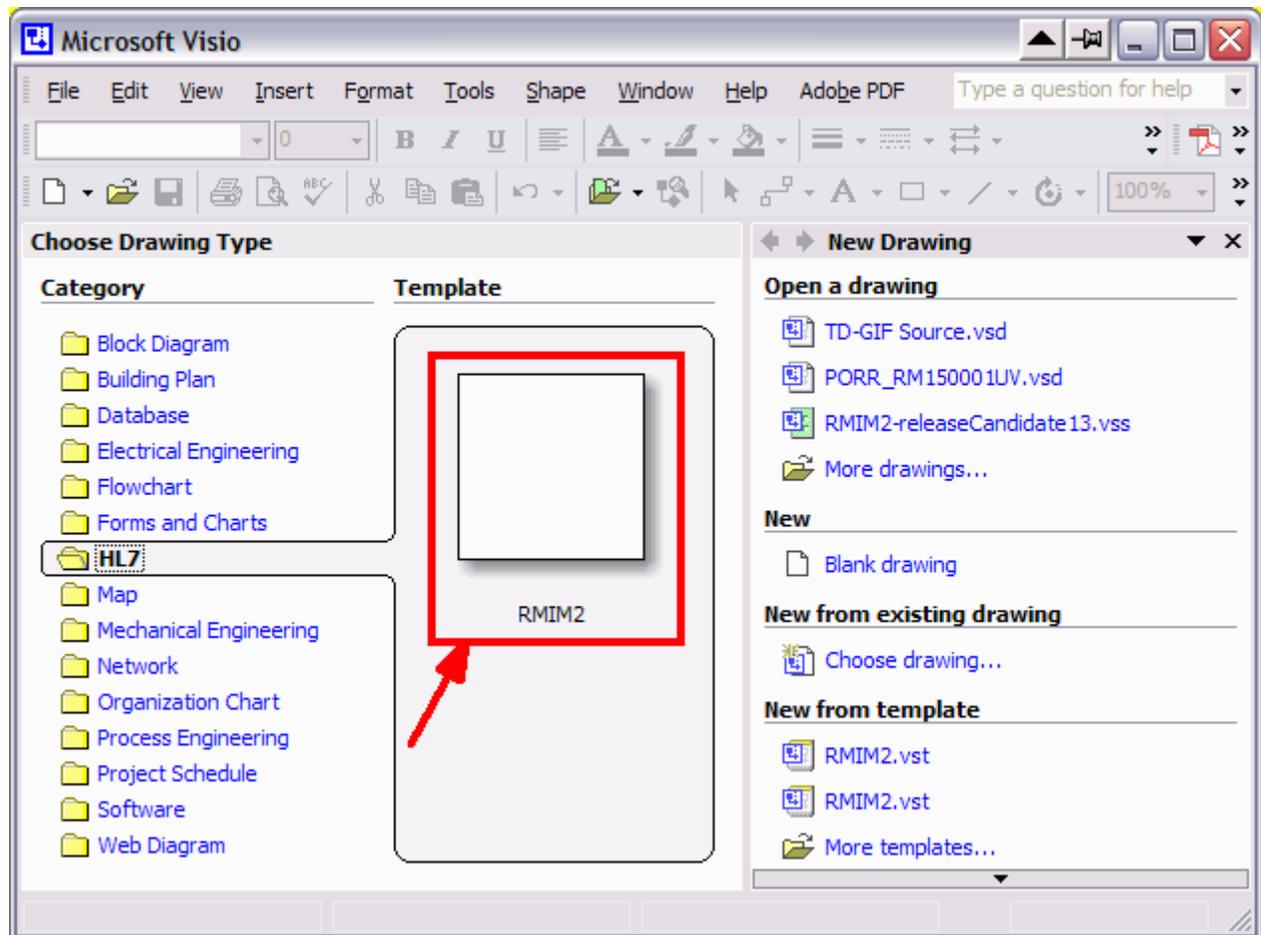

3.3.2 Visio 2003
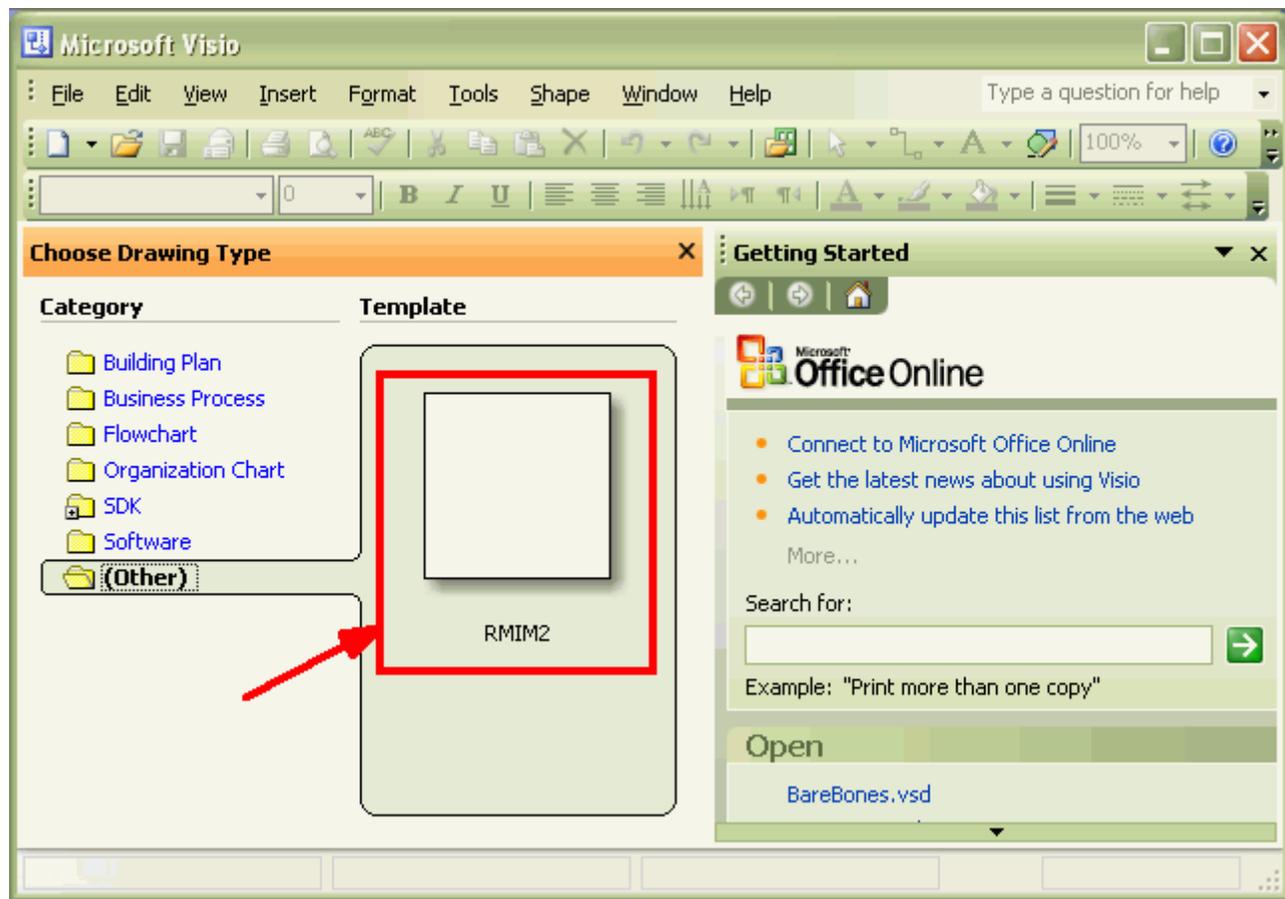
3.3.3 Visio 2007
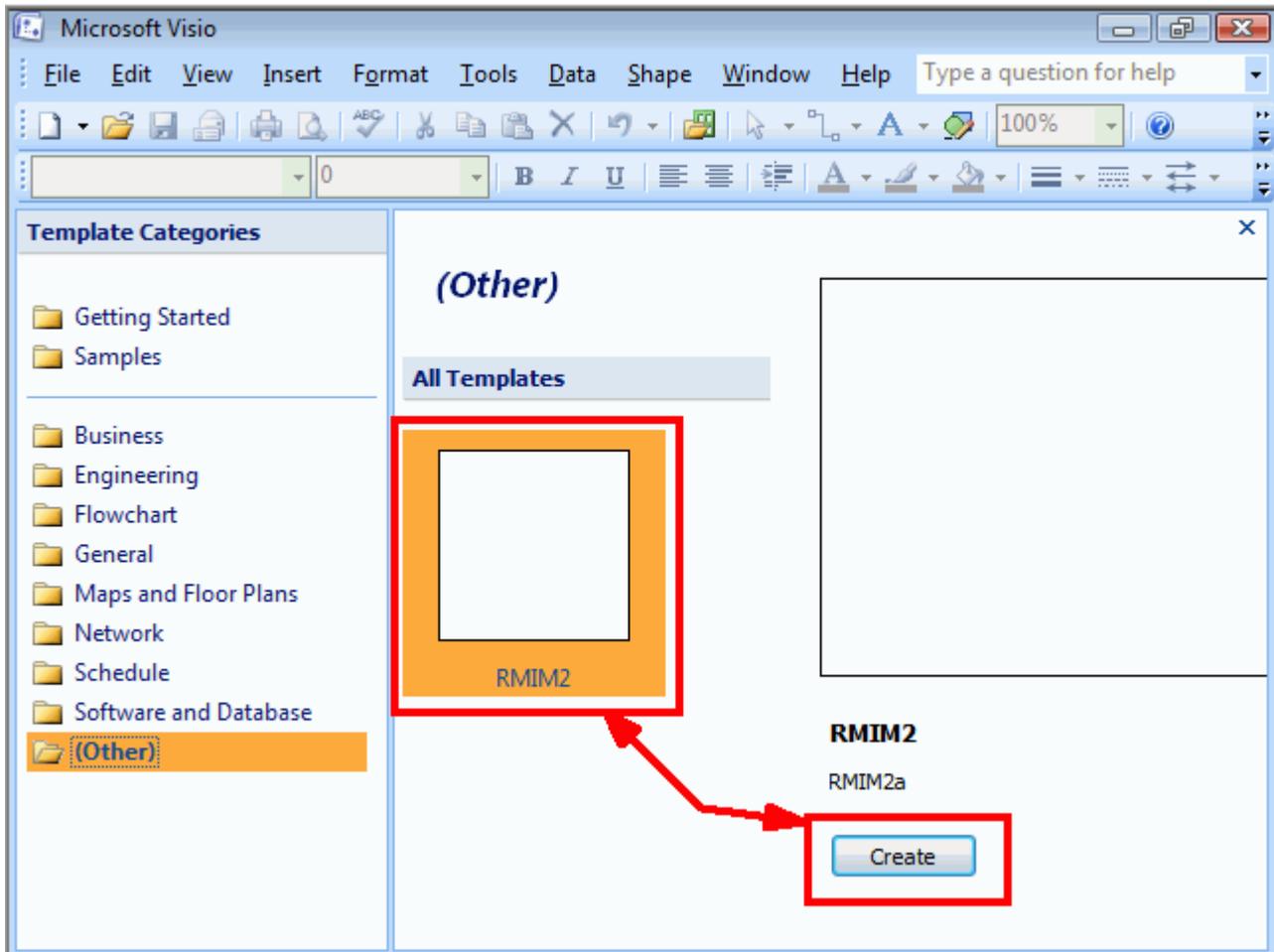
4 "New" HL7-menu selections & what they do

The software changes that support Visio 2003/7 and migration between Visio 2002 and Visio 2003 file formats caused a number of changes in the "HL7" menu that provides access to many functions. These include the creation of a new menu for the Stencil window, move of batch functions from Drawing window to Stencil window, and addition of options in the Drawing menu.

4.1 Stencil Menu

As a result of these changes, we recognized that certain menu functions should be invoked from the Stencil window (from whence the shapes are dragged to create a new clone) rather than from the Drawing window. These include all of the "Batch functions" that are applied to a set of selected drawing files, rather than to a single, open drawing, and a new function needed to "re-connect" a drawing to the RMIM Designer software.

To this end, an "HL7" menu was added to the Stencil window, as shown in the following diagram. This menu is invoked by first clicking on the "title bar" of the Stencil window, to activate that window, and then clicking on the HL7 menu set. (If the Stencil window is not displayed, you can force its display by choosing **Menu…Window…Tile** from either window.)
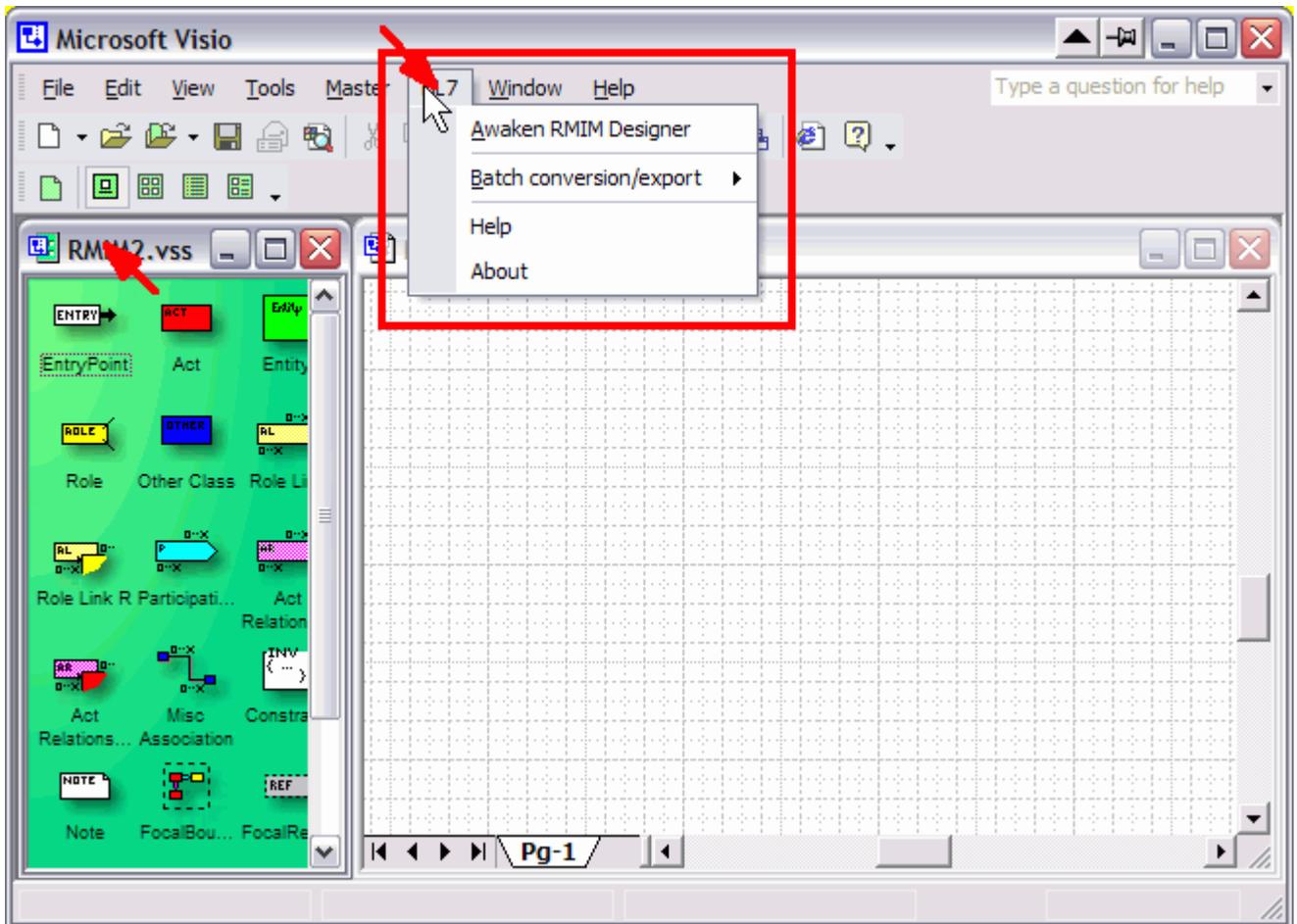
Two of the entries in this menu have been in RMIM designer for some time. These are **Help** which links to the RMIM Designer Help file in HTML, and **About** which gives specifics about the installed version of the RMIM Designer software. The remaining two entries are discussed below:

4.1.1 `Awaken RMIM Designer` in Stencil Menu

The "**Awaken RMIM Designer**" menu is used to invoke a process that re-establishes the binding between a drawing and the RMIM Designer software in the event that the binding is broken. The core binding is established whenever a drawing is opened, but may be ruptured in unusual circumstances, usually resulting from software errors, that sometimes arise when "foreign" (non-RMIM Designer) shapes are encountered on a document. There are various symptoms, of this disconnect. One is that double-clicking the shapes no longer opens the Clone Editor; another is the absence of the "HL7" menu in the drawing window, and a third is the case when **all** usable menu entries are disabled (greyed out) as seen in the figure that follows.

In all cases, the connection can be restored by selecting Awaken RMIM Designer from the stencil menu. In the rare case where this menu is also missing. select "`Menu:`
`Tools…Macros…(RMIM2)…AwakenDesigner…AwakenRMIMDesigner`. The figure showing disabled menus follows:
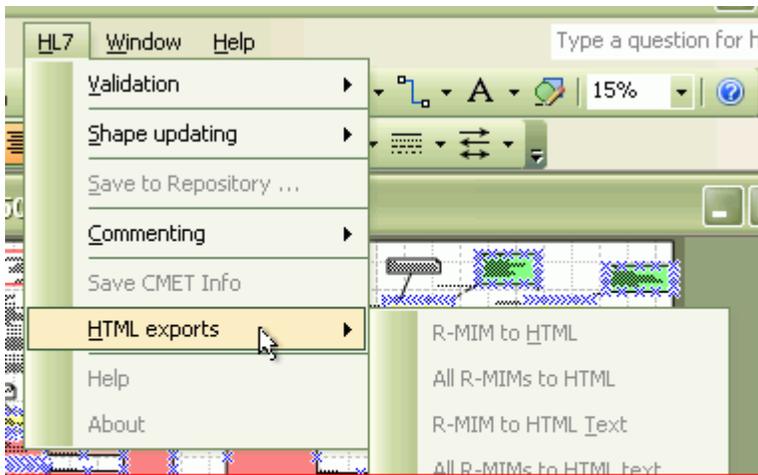
Symptom of drawing "dis-connected" from the RMIM
Designer software — Leaf-level options on HL7 Menu
are all disabled (greyed out). Fix using:
StencilMenu...HL7...Awaken Rmim Designer

4.1.2 Batch options on Stencil Menu in Visio 2002

In Visio 2002, there is only one Batch process selection on the Stencil menu. This is the selection
used to export "Clicakble Graphics" files from Visio for use in publishing RMIM designs in the
ballot. This process is used primarily by HL7 HQ during ballot processing. The menu entry is
shown on the following figure.
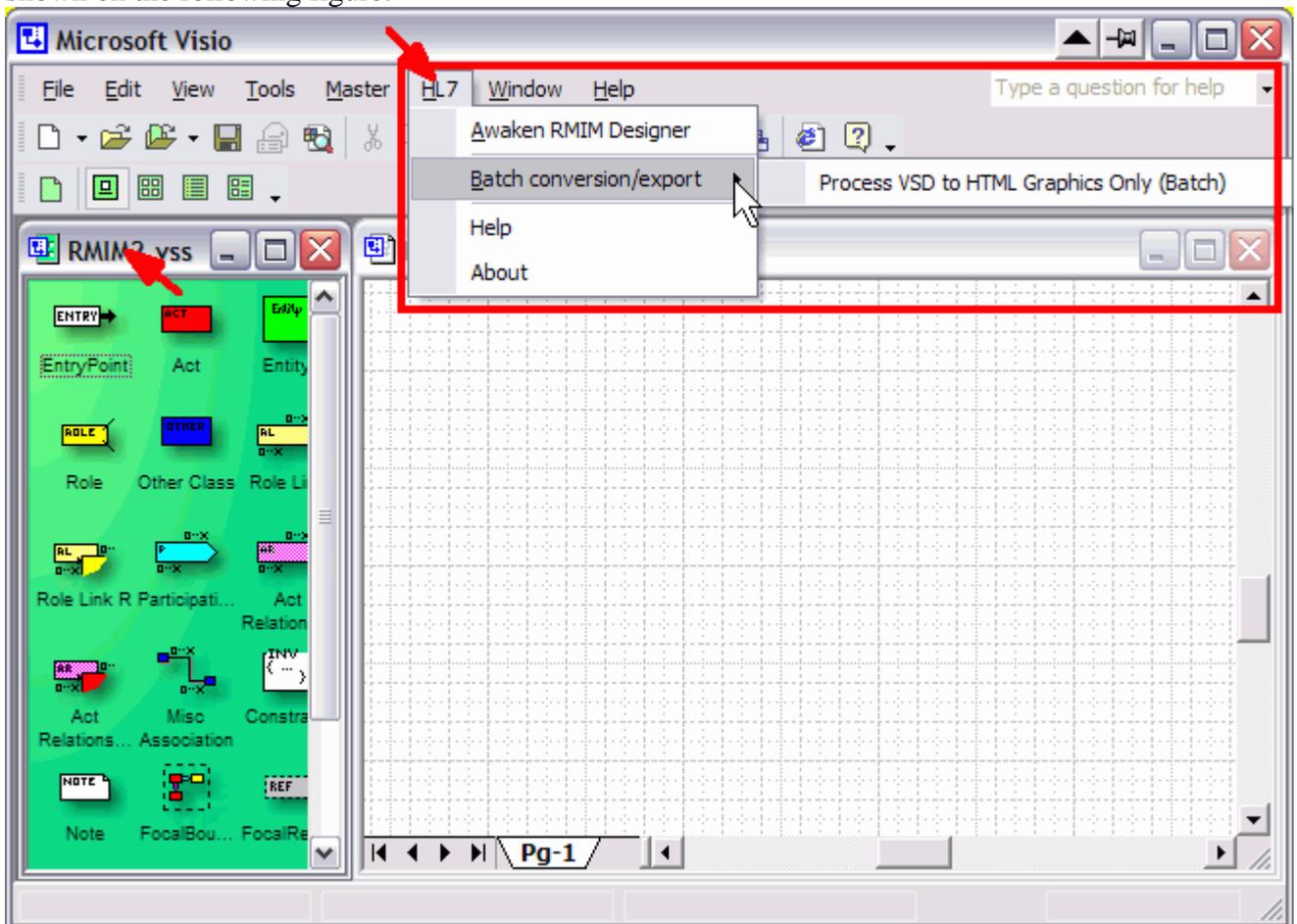
4.1.3 Batch options on Stencil Menu in Visio 2003 and Visio 2007

There are three options in the Batch process set in Visio 2003 and Visio 2007. The Graphics process step, mentioned above is also available here. The other two choices provide access to batch upgrades from Visio 2002 format to the Visio 2003/7 format, and batch reversions from Visio 2003/7 format to Visio 2002 format. Discussion of the processes for upgrade and reversion appears later.
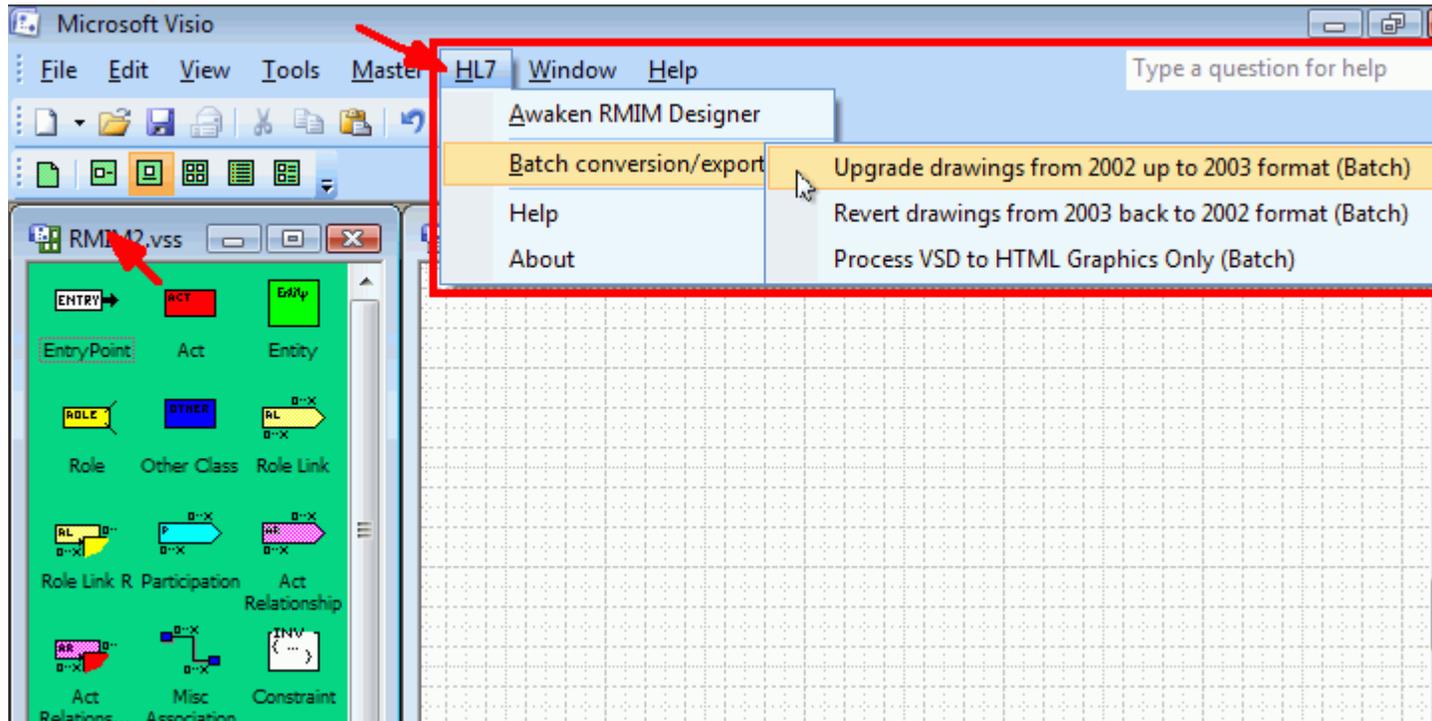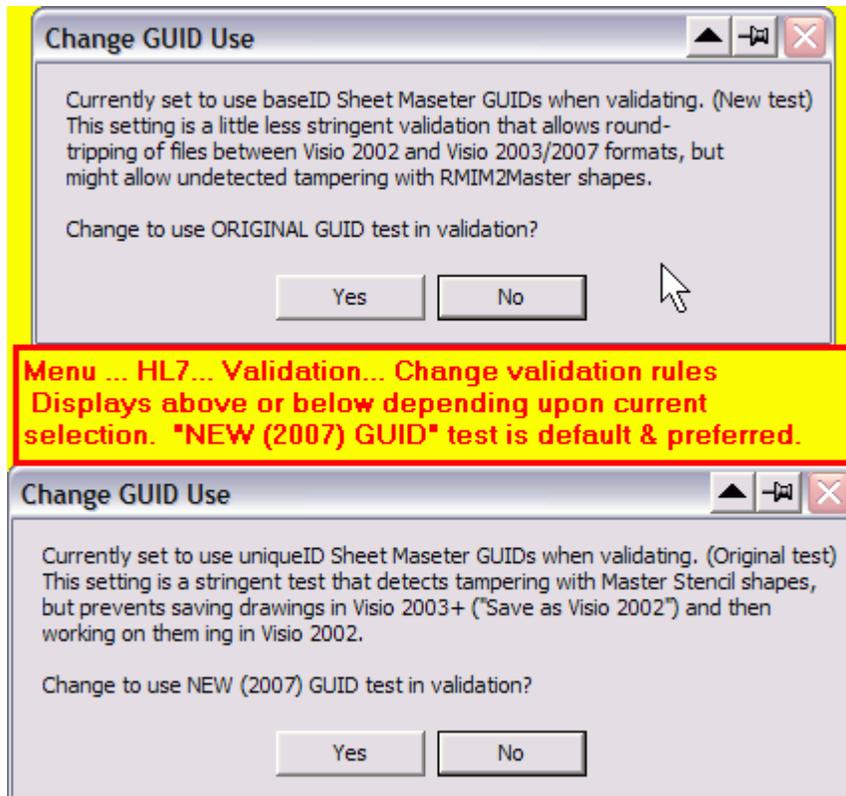

4.2 Drawing menu

The Drawing menu (seen when the application "focus" is on the Drawing window) has one element removed and several added. The removal resulted from moving the batch graphics creation option from the Drawing menu (from under **HL7…HTML exports**) to the Stencil menu.

The two additions are selections that allow one to set or reset one option related to Model shape validation and one option that controls the automation shape updating when models are converted.

4.2.1 Shape validation rules

The rules by which drawings are validated against the master shapes on the RMIM2 Stencil were altered in this release of the RMIM designer, but an option was provided to revert to the original test, if desired. The following figure shows the dialog boxes that occur when one selects **Menu**…**HL7**…**Validation**…**Change validation rules** under the Drawing Menu.
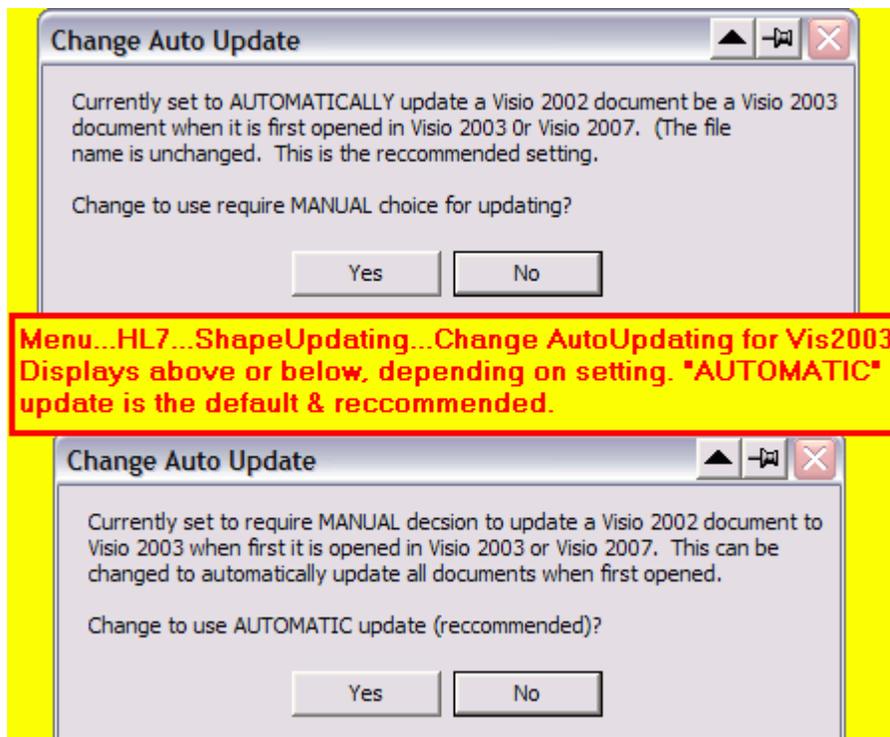- o The upper dialog appears when the menu selection is made and the default option is set to use the "New" Test of shape validity when validating. Select **No** to retain the New Test, and select "**Yes**" to revert to the original rules.
- o The lower dialog appears when the menu selection is made and the option has been set to use the "Original" Test of shape validity when validating. Select **No** to retain the Original Test, and select "**Yes**" to use the "new" rules.

Change GUID Use

Currently set to use baseID Sheet Maseter GUIDs when validating. (New test)
This setting is a little less stringent validation that allows round-
tripping of files between Visio 2002 and Visio 2003/2007 formats, but
might allow undetected tampering with RMIM2Master shapes.

Change to use ORIGINAL GUID test in validation?

[Yes] [No]

Menu ... HL7... Validation... Change validation rules
Displays above or below depending upon current
selection. "NEW (2007) GUID" test is default & preferred.

Change GUID Use

Currently set to use uniqueID Sheet Maseter GUIDs when validating. (Original test)
This setting is a stringent test that detects tampering with Master Stencil shapes,
but prevents saving drawings in Visio 2003+ ("Save as Visio 2002") and then
working on them ing in Visio 2002.

Change to use NEW (2007) GUID test in validation?

[Yes] [No]

4.2.2 Selecting "manual prompt" or automatic updating for file format conversion

The options to upgrade a drawing from Visio 2002 to Visio 2003/7 format is made whenever a Visio 2002 file is opened in Visio 2003 or Visio 2007. The software offers the user the chance to opt for semi-automatic conversion, or conversion initiated by a prompted manual process. This change is upgrade processing option is initiated by selecting **Menu…HL7…Shape updating…Change Auto Updating for Vis2003** under the Drawing Menu. This produces one of the two dialog boxes shown in the figure below.

- o The upper dialog appears when the menu selection is made and the default option is set to use the "Automatic" updating. Select **No** to retain the AUTOMATIC update, or select "**Yes**" to rely on prompted MANUAL process.
- o The lower dialog appears when the menu selection is made and the default option is set to use the "Manual" updating. Select **No** to retain the MANUAL update, or select "**Yes**" to rely on AUTOMATIC updating process..

Change Auto Update

Currently set to AUTOMATICALLY update a Visio 2002 document be a Visio 2003 document when it is first opened in Visio 2003 0r Visio 2007. (The file name is unchanged. This is the reccommended setting.

Change to use require MANUAL choice for updating?

Yes   No

Menu...HL7...ShapeUpdating...Change AutoUpdating for Vis2003 Displays above or below, depending on setting. "AUTOMATIC" update is the default & reccommended.

Change Auto Update

Currently set to require MANUAL decsion to update a Visio 2002 document to Visio 2003 when first it is opened in Visio 2003 or Visio 2007. This can be changed to automatically update all documents when first opened.

Change to use AUTOMATIC update (reccommended)?

Yes   No

5 Migrating Model Designs Across Different File Formats

As noted in the Introduction, in order to migrate models from Visio 2002 to Visio 2003 requires that the shapes on the existing drawing undergo a dynamic revision during format conversion, and selected addition of fields in the shape data. Since each migration required a software process, provisions were included to perform these updates "manually", semi-automatically and in batch mode (bulk migrations).

## 5.1 Single/batch migration of designs from Visio 2002 up to Visio 2003/7

As noted, processing is required to migrate from Visio 2002 to Visio 2003/7 file format. This is over and above the option that Visio 2003/7 provide to "save as" an alternate file format. The updating of a single file can be based on response to a prompt, or made semi-automatic when a Visio 2002 file is opened, depending on the option set as noted above. Further, the process can be performed in "unattended" batch mode.

5.1.1 Prompted MANUAL process for upgrade

If the MANUAL conversion option is set, and a Visio 2002 file is opened in Visio 2003 or Visio 2007, the following dialog appears:
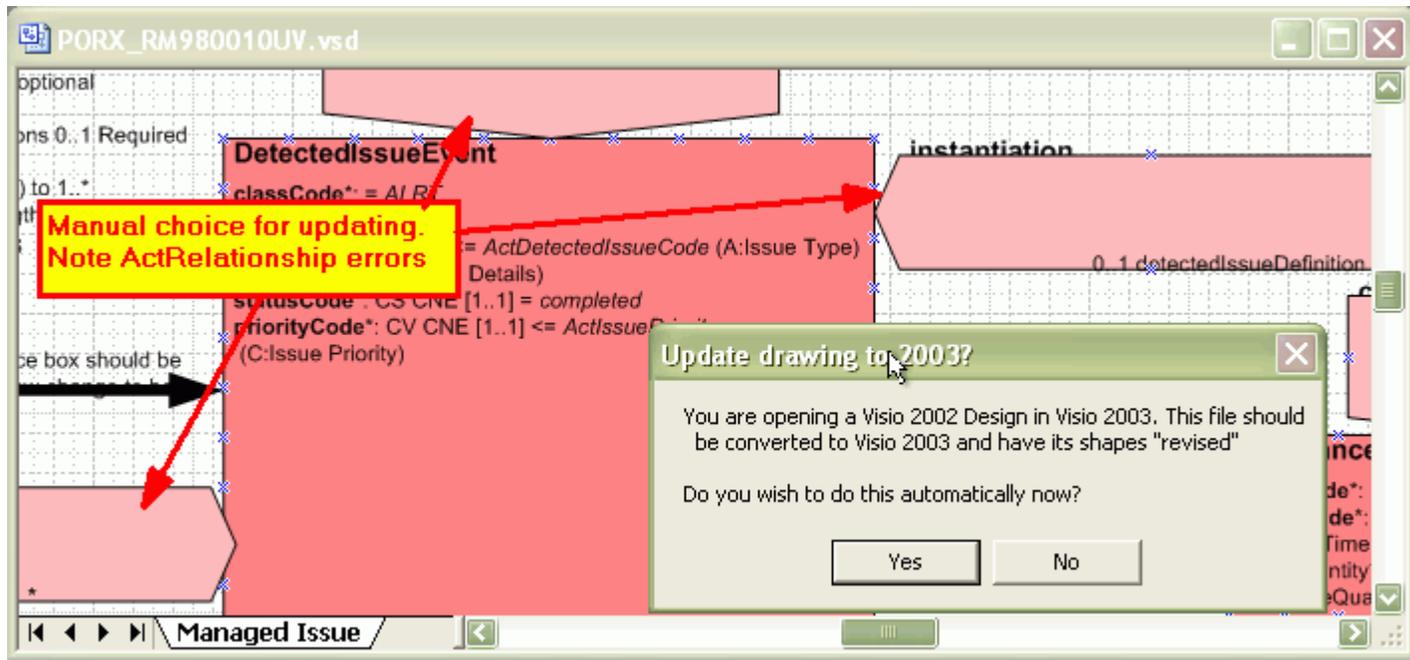
This dialog presents the choice of proceeding to update the drawing or not. Note the errors in the rendition of the ActRelationship shapes in this drawing. This is typical of the rendering error that occurs if Visio 2002 RMIM files are opened in Visio 2003 with no updating. Selecting **"Yes"** will result in the shape being corrected, saved in Visio 2003 format **over-writing the original Visio 2002 file with a Visio 2003 format file of the same name and in the same directory**, and reopened, displaying the correct format, as below:
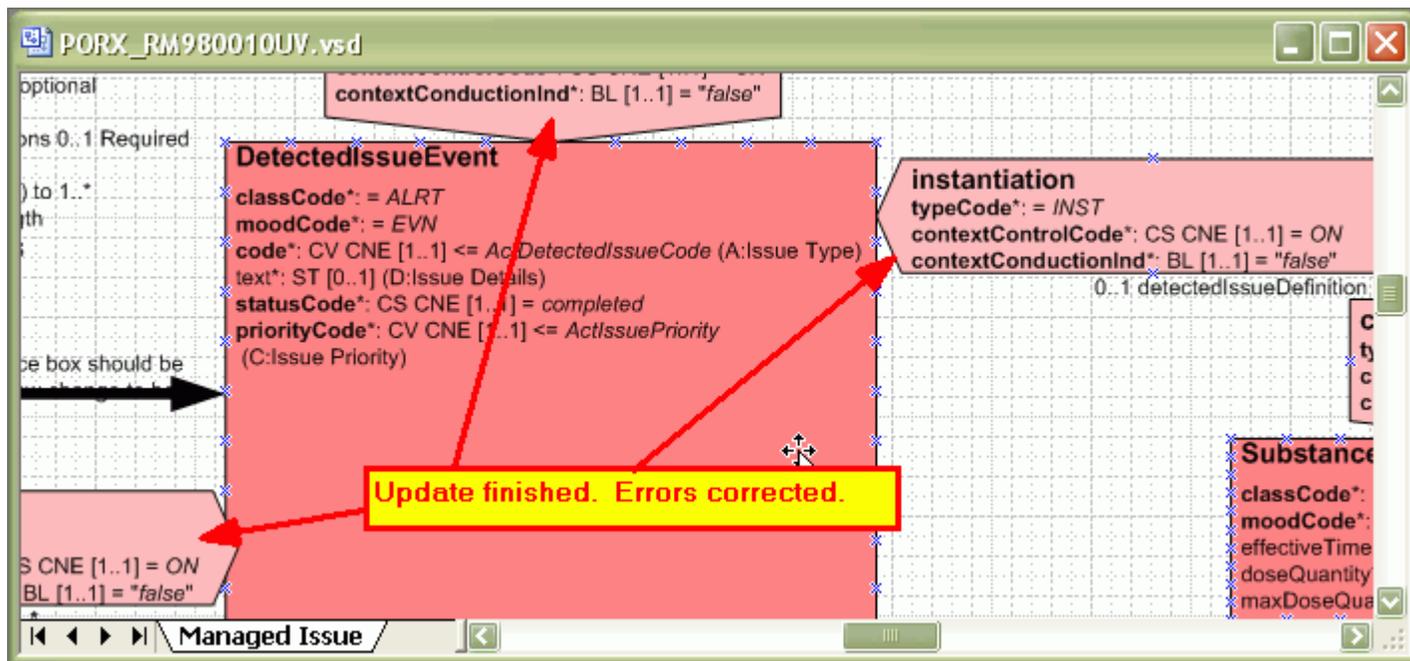
5.1.2 Semi-automatic updating

If the AUTOMATIC conversion option is set, and a Visio 2002 file is opened in Visio 2003 or Visio 2007, the following dialog appears:
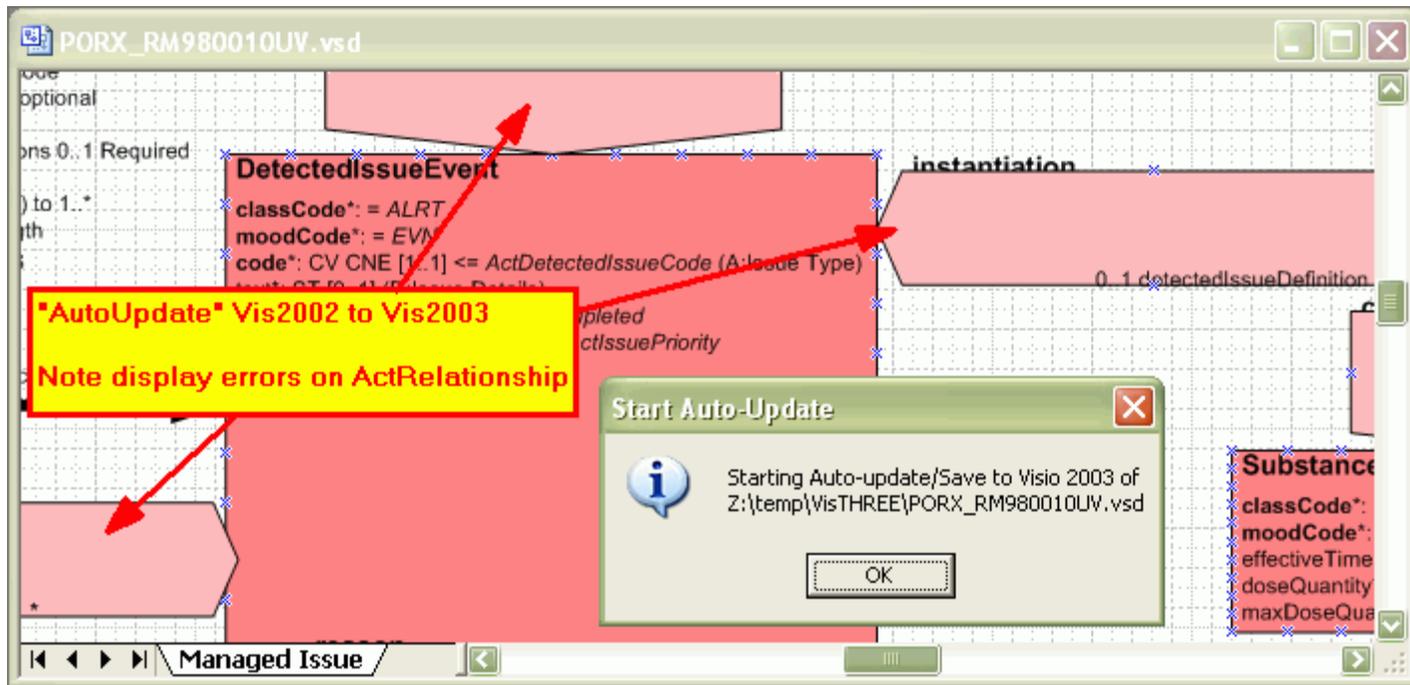

Note this dialog offers no choice, it simple acknowledges that an update will be performed. As above, note the errors in the rendition of the ActRelationship shapes in this drawing. Clicking **"OK"** will cause the shape to be corrected, saved in Visio 2003 format **over-writing the original Visio 2002 file with a Visio 2003 format file of the same name and in the same directory**, and reopened, displaying the correct format, as shown in the second figure above.

5.1.3 Batch migration of designs from Visio 2002 up to Visio 2003/7

Batch migration is initiated with **Menu…HL7…Batch conversion/export…Upgrade drawings from 2002 to 2003 format (Batch)** on the Stencil Menu. This selection initiates the following set of dialog interactions and displays:
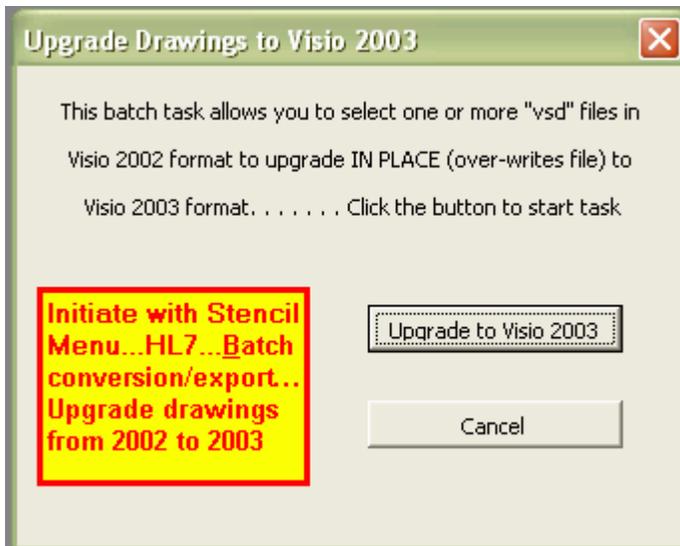
This initial dialog is presented to allow the user to proceed with the Batch task or not. Assuming they proceed, they see:
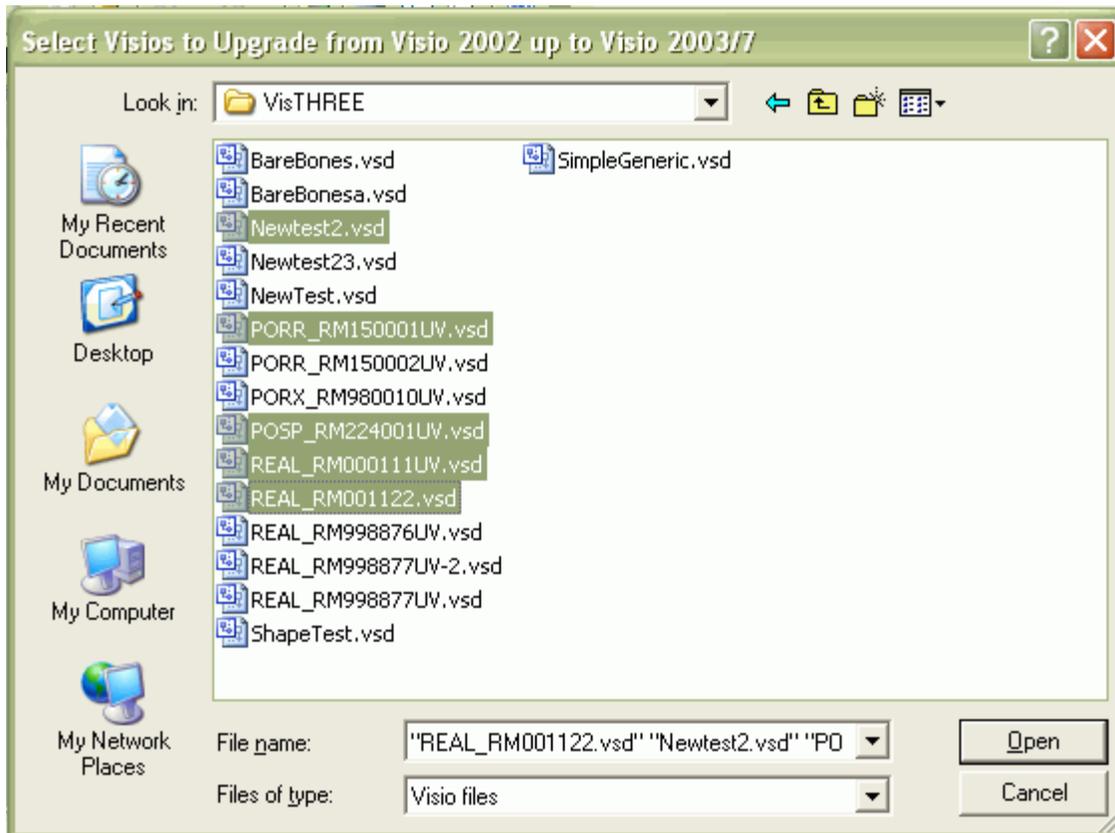
This is a standard file selection dialog with the ability to select one or more files from a single file directory. (Shift-click to select ranges of files, Ctrl-Click to select or de-select individual files, etc. The user can terminate the process at this point by selecting no files or by clicking "Cancel." Once the files have been selected, click "Open" to proceed.

As each drawing is converted, it will be loaded into Visio and displayed, along with the above informational dialog. This allows the user to monitor progress through the process. When the last file has been processed, the system will display a simple "Upgrade done" dialog if there were no exceptions, or the following to report exceptions:
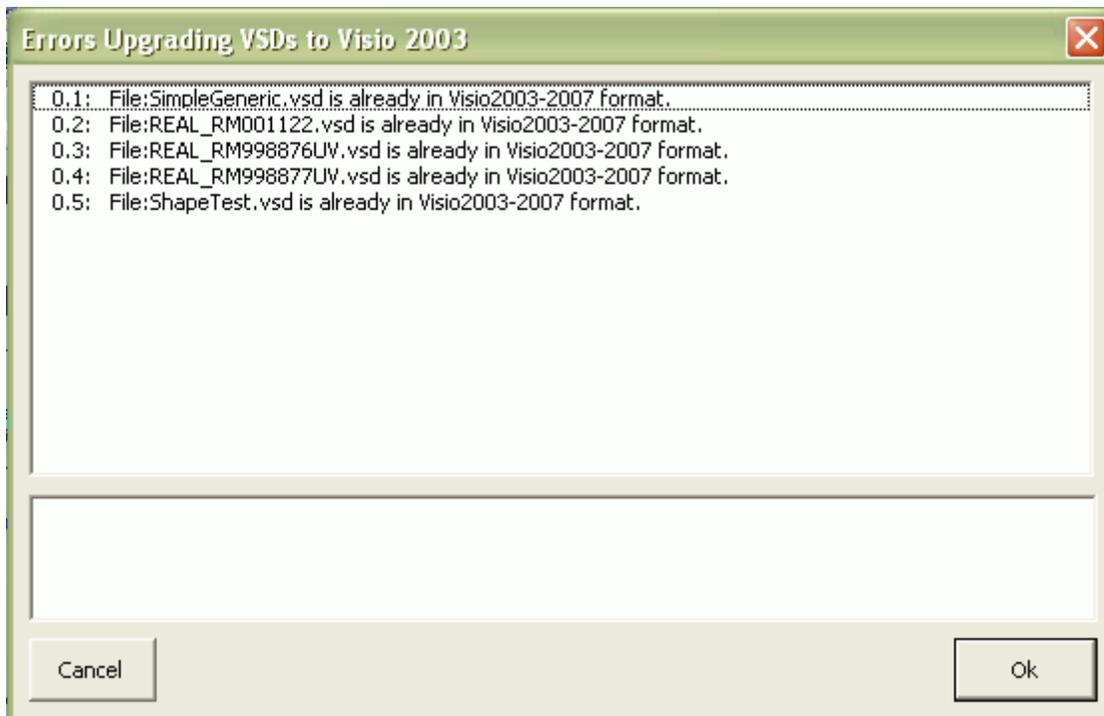

This dialog reports any "errors" in the upgrade. The most common error is selecting to upgrade a file that has already been upgraded or was created in the Visio 2003-2007 format, as shown here. Clicking "OK" completes the process.

5.2 Single/batch migration of designs from Visio 2003/7 back to Visio 2002

5.2.1 Reverting a Single File to Visio 2002

A drawing that was upgraded to Visio 2003/7 or created there van be "reverted" to the Visio 2002 format by using **Menu…File…SaveAs** and then selecting Visio 2002 from the "Save as type" drop-down box on the "Save As" dialog, as shown on the figure below. As noted in section 2.1.1, this action will correctly set the file format, but will not record the revised document version in the Document.Category property.
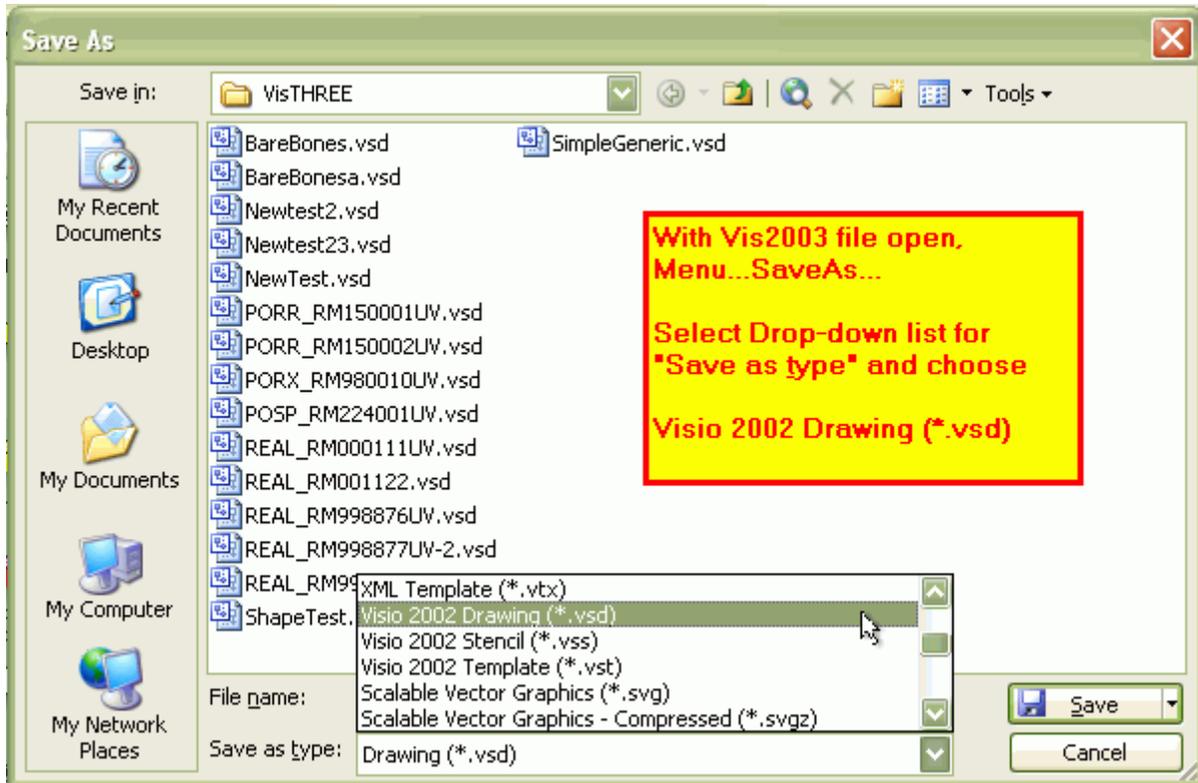
5.2.2 Batch migration of designs from Visio 2003/7 back to Visio 2002

The process for migrating a collection of drawings from Visio 2003/7 back to Visio 2002, is very similar to the process of upgrading a batch of drawings. Batch migration is initiated with **Menu…HL7…Batch conversion/export…Revert drawings back to 2002 from 2003 format (Batch)** on the Stencil Menu. The initial dialog displayed is:
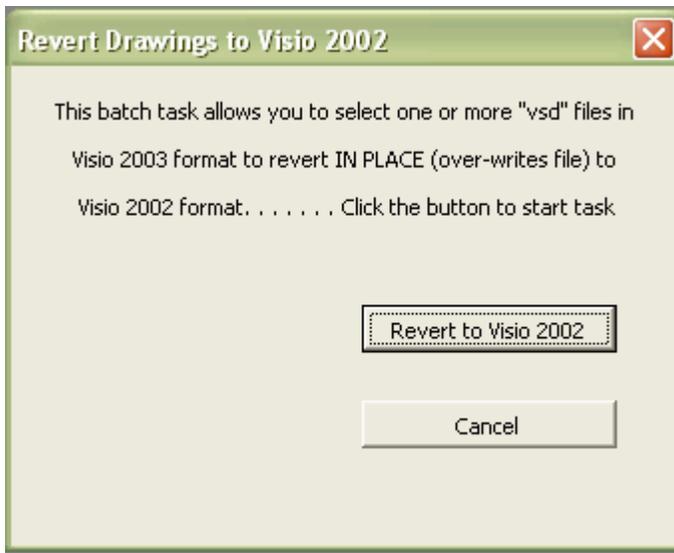
If the user clicks "**Revert to Visio 2002**" to start the process, the set of dialogs is very similar to the dialogs shown earlier for moving documents from Visio 2002 up to 2003. The only change is in the dialog labels that indicate the direction of conversion.

5.3 Managing shared drawings in a multi-version environment

It should be clear that sharing documents among a group of people some of whom use Visio 2002 and some who use later releases will require some planning. Conversion can be done as often as needed between versions, but **all conversions must be done on either Visio 2003 or 2007**. Visio 2002 is unable to open a Visio 2003/7 file.

HL7 Publishing will accept files in either format, but will convert all files received to Visio 2003 format in order to for publish them.

6 Testing Visio 2003-2007 Releases

Current resting of these new functions has been limited to a small number of files, but files that had been chosen for their complexity or unusual features. Please report ANY errors immediately to the RMIM Designer BUG tracker on Gforge at:

6.1 Untested functions in various Visio Releases