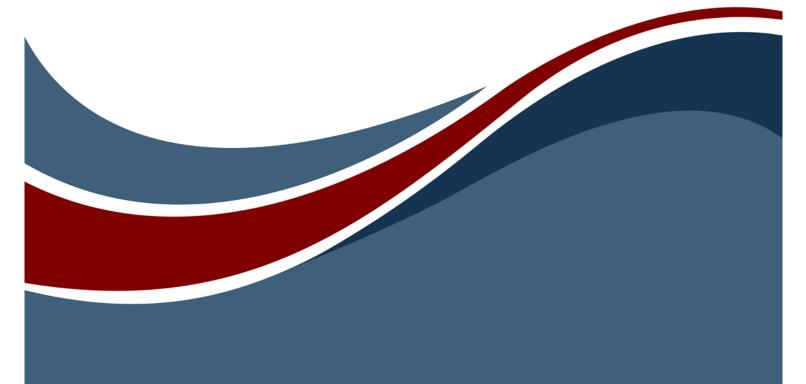


Excel® Connector Guide



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Publication Date: April 2020



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CUSTOMER RESOURCE OPTIONS

Supporting users throughout their entire journey of learning model-based systems engineering (MBSE) is central to Vitech's mission. For users looking for additional resources outside of this document, please refer to the links below. Alternatively, all links may be found at www.vitechcorp.com/resources.



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Library of technical and white

papers for download, authored

by Vitech systems engineers.

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through installation and usage of

Vitech software.

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All Resources	<u>Advanced</u>
<u>Beginner</u>	<u>IT / Sys Admin</u>
Intermediate	<u>Student</u>



PREFACE

This Excel Connector Guide provides information on how to install and use an Excel extension developed to connect the GENESYS[™] database to Microsoft[®] Excel[®]. The connector is a .NET application that extends the Excel spreadsheet provided in Microsoft Office[®] 2010, 2013, and 2016. Figure 1 displays the extended blank Excel worksheet.

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Figure 1 Sample Excel Connector

This guide describes the process to import and add the extension in Excel, how to interface directly with the GENESYS repository and individual projects in the repository, how to use the features in the Excel extension to import and export data out of the GENESYS data repository, and how to use the dashboard features coded into the Excel extension.

This guide is intended to augment the MBSE with GENESYS training course and the reference material provided with GENESYS. The ultimate goal of this guide is to expose the user to the Excel extension and thereby extend the use and application of GENESYS for both system design and development, and project management associated with the system development project.

The following additional resources are available for use with this guide:

- For descriptions of GENESYS including database classes and folders, different views, diagram notation, and the mechanics of entering data into GENESYS, the reader is referred to the GENESYS Help/Documentation folder.
- For the definition of schema terms, the reader is referred to the GENESYS schema, which contains descriptions for each schema entity.
- For application of GENESYS to system and architecture design, the reader is referred to the GENESYS System Definition Guide (SDG) and Architecture Definition Guide (ADG) supplied with the GENESYS software installation.



GENESYS EXCEL CONNECTOR INSTALLATION AND MANAGEMENT

1.1 Installing the Excel Connector

The GENESYS Excel connector is installed via a standard, familiar Windows setup program. Please note that separate installers are available for either 64-bit or 32-bit Windows and Excel operating environments. The connector runs in Microsoft Excel 2010, 2013, and 2016.

The files for installing the Excel Connector are named: "GENESYS2020ExcelConnector_x86.exe" (for 32bit Windows operating systems) and "GENESYS2020ExcelConnector_x64.exe" (for 64-bit Windows operating systems).

Double-click the installer .exe file to begin the installation. Click "Next."



Figure 2 Excel Connector Installer, Step 1



Review and accept the licensing agreement terms, and click "Next."

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License Agreement			1
Please read the following license agreen	nent carefully.		0
IMPORTANT READ CAREFULLY: is a legal agreement between either "you") and Zuken Vitech Inc. ("Vitech below, which includes computer so printed materials, and "online" or "PRODUCT"). YOU AGREE THAT THI WRITTEN NEGOTIATED AGREEMEN otherwise using the PRODUCT, you a you do not agree to the terms of this E	an individual or a sin h [*]) for the Vitech sofi ftware and may inclu- electronic documen S AGREEMENT IS EN T SIGNED BY YOU. E Igree to be bound by t	gle entity ("Licentware product io ude associated tation (collectiv IFORCEABLE L By installing, cop he terms of this	nsee" or dentified media, rely, the IKE ANY bying, or EULA. If
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	< Back	Next >	Cancel

Figure 3 Excel Connector Installer, Step 2

Click "Install" to begin the installation.

🖟 GENESYS 2020 Excel Connector - Insta	allShield Wizard		×
Ready to Install the Program			1
The wizard is ready to begin installation.			
Click Install to begin the installation.			
If you want to review or change any of y exit the wizard.	your installation se	ettings, <mark>click Back. C</mark> l	ick Cancel to
InstallShield			
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Figure 4 Excel Connector Installer, Step 3



The setup program will run and install the Excel Connector. When the process completes, simply click "Finish" to complete the installation. The connector will now be available for use in any Excel worksheet.



Figure 5 Excel Connector Installer, Step 4



1.2 Managing the Excel Connector

Add-ins to Excel are sometimes disabled by customers. Note that in order for our connector to work, you may be required to adjust your settings by enabling the ability of Excel to use Add-ins.

Once installed, the GENESYS Excel connector can be managed via standard Microsoft Office add-in tools. Note that the steps below apply to Microsoft Excel 2013 installations, and may vary slightly in different versions of Excel.

The extension to GENESYS in Excel is accessed via the "GENESYS" tab in an open workbook, as shown in Figure 6 below. To manage the connector, first click the "FILE" tab.

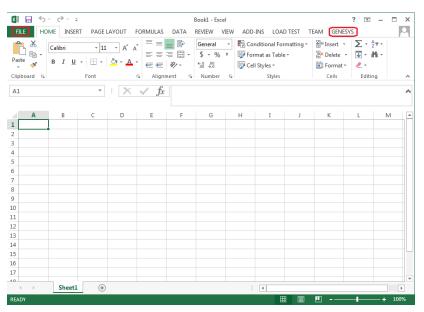


Figure 6 Excel GENESYS and FILE tabs

Once in the "FILE" tab, click the "Options" item from the menu on the left.

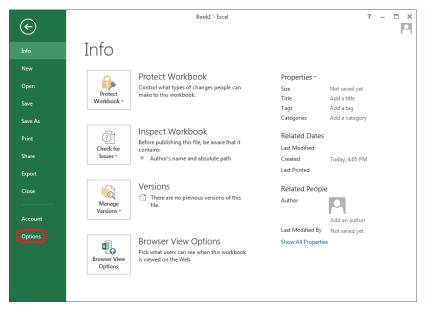


Figure 7 Excel FILE tab, Options menu item



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Proofing	User Interface options		
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Language Advanced	✓ Show Quick Analysis options on selection ✓ Enable Live Preview ③		
Customize Ribbon Quick Access Toolbar	ScreenTip style: Show feature descriptions in ScreenTips When creating new workbooks		
Add-ins Trust Center	Use this as the default font: Font size: Default view for new sheets: Include this many sheets: Personalize your copy of Microsoft Office User name: Always use these values regardless of sign in to Office. Office Background: Circles and Stripes v Office Theme: Colorful v		
	Start up options		
	Choose the extensions you want Excel to open by default: Default Programs I cell me if Microsoft Excel isn't the default progam for viewing and editing spreadsheets. Show the Start screen when this application starts		
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Figure 8 Excel Options dialog, Add-ins Menu Item

In the Add-ins dialog that opens, select "COM Add-ins" from the "Manage:" combo box at the bottom, then click the "Go..." button.

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Proofing	Add-ins					
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	Microsoft Power Pivot for Excel	C:\ivotExcelClientAddIn.dll	COM Add-in			
ustomize Ribbon	Microsoft Power View for Excel	C:\ReportingExcelClient.dll				
Juick Access Toolbar						
	Visual Studio Tools for Office Design-Time Adaptor for Excel	COM Add-in	E.	-		
Add-ins	Add-in: GENESYS 2020 Excel Connector					
rust Center	Publisher: <none></none>					
	Compatibility: No compatibility information available					
	Location: file:///C:\Program Files (x86)\Vitech\GENE Vitech.Genesys.Connector.Excel.vstolvstol					
	Description: GENESYS 2020 Excel Connector					
	M <u>a</u> nage: Excel Add-ins 💌 <u>G</u> o					
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Figure 9 Excel Add-ins dialog, Manage COM Add-ins Option

In the COM Add-ins dialog that opens, select the GENESYS Excel Connector item. Any of three actions can be performed:

1) The GENESYS connector can be unchecked. Clicking "OK" will then disable the connector from running in workbooks.



- 2) If the GENESYS connector is unchecked, it can be checked. Clicking "OK" will then enable the connector to run in workbooks.
- 3) The GENESYS connector can be selected, and the "Remove" button can be clicked. The connector will be uninstalled.

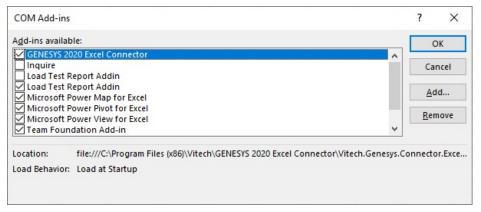


Figure 10 COM Add-ins Dialog, Managing the GENESYS Connector

CONNECTING EXCEL WITH GENESYS

1.3 Connecting to GENESYS from Excel

With Excel opened on your desktop, navigate to a blank workbook, or open a blank workbook. Select the GENESYS tab on the ribbon. You can then 'connect' Excel by logging in to GENESYS using the icon on the left-hand side of the ribbon.

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Figure 11 GENESYS Login Using Ribbon Button

Clicking on the GENESYS Login button will launch and bring up the GENESYS login screen.



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Figure 12 Excel Spreadsheet with GENESYS Login

Log in to GENESYS using the appropriate Username and Password. This connects Excel with the Repository. Once logged into GENESYS, the controls on the GENESYS ribbon will be "active" and no longer be grayed out.

1.4 The GENESYS Ribbon in Excel

There are several sections on the GENESYS ribbon in Excel which are used to control access to the GENESYS database.

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	Repo	sitory /	Project		Ta	ble Definition	ns		Dashboa	ards		

Figure 13 GENESYS Ribbon in Excel

The Repository / Project section controls access to a particular system design project in the GENESYS repository. Within this section the "Project" selection provides a drop-down menu where the user can select the particular project with the selected repository. This is the project from which all other Queries will be associated in Excel.

The Table Definitions section of the ribbon allows the user to define a table to facilitate import / export of information in the selected project's system design repository in GENESYS. Each control in this section is described below:

- Table Definition: Opens a separate dialog box used to define what design repository information will be used in the excel spreadsheet; a detailed explanation of the features of the Table Definition dialog box features is provided in the next section of the document.
- Publish Changes: a quick button command used to publish (or "push") changes in the spreadsheet into the design repository.
- Publish All: a quick button command used to publish ALL of the entities from the spreadsheet in to the project design repository.



The Dashboards section of the ribbon allows the user to select a particular Dashboard from the drop-down menu and display the information in Excel workbook. Detailed description of the Dashboard functionality is provided in Section 1.7 below.

IMPORTING DATA FROM GENESYS INTO EXCEL

1.5 Querying the GENESYS project from Excel

The user can make a simple query of the selected project using the options provided in the ribbon. Clicking on the Table Definition button, the user will open a new dialog box used to query the design repository. This dialog box is used to either query (or extract) information from the database as well as import or update information into the database. Table Definitions when saved are saved to the project which was selected in the Project drop-down menu within the Project Repository section of the Excel GENESYS ribbon.

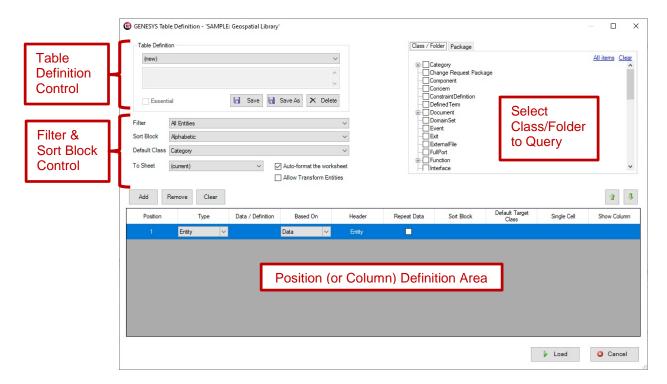


Figure 14 GENESYS Table Definition Dialog Box

The dialog box has four main sections. The various options in the overall dialog box provide for the following:

- Select Class/Folder to Query section allows the user to select the Class or Folder from which to extract information for the spreadsheet. Selecting the Package tab allows the user to select Packages from which to extract information.
- Column Definition Area allows for customizing the selection and display of information associated with entities selected from the repository. The Position listed is associated with the column number in the Excel spreadsheet.
- Filter & Sort Block Control area provides the ability to filter and sort information before it is placed in the Excel spreadsheet. The Filter's and Sort Blocks' drop-down menus are populated from the GENESYS project selected.
- The "Allow Transform Entities" option allows the ability to change an entity's class in order to move it from one class to another. Note that this could result in loss of data from attributes and relationships that are not transformed.



• Table Definition Control area allows the creation, opening, and saving of the definition of a table.

[NOTE: User-created tables (the table definitions) are unique to and saved with the particular project. If the user wants to use a table definition in multiple projects, then the table definitions (only) need to be saved using Advanced Options on Export. The table definitions can then be imported into other projects as desired.

Once all the selections have been made, the user will populate the workbook using the "Load" button. An example of constructing and loading a table is shown below.

The table definition for a table of requirements listing the Requirement number, name, description, and the "refined by" requirements is provided as an example.

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			Allow Tra	nsform Entities					
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		number				Sort Block		Single Cell	Show Colum
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Figure 15 Example Table Definition

For this example, the Requirement class was selected in the upper right-hand Class/Folder to Query section. The Sort Block "Numeric" was selected to provide an output in numeric order. The column selection in the Position (or Column) Definition Area provides for the display of, in order from top to bottom:

- 1. Requirement Number by selecting Entity Attribute, then number, and providing a unique Header title.
- Entity Name by selecting Entity Attribute, then name, and providing a unique Header title. (NOTE: the Type "Entity" provides for the number and name in the same cell if the Sort Block = Numeric. If you use the Type = Entity and you intend to update the information on the table and push this information back into GENESYS then, you must use the Sort Block = Alphabetic.)
- 3. Description by selecting Entity Attribute, then description, and providing a unique Header title.
- 4. Refined By requirements by selection Relationship, then the "refined by" relation. In order to list the "refined by" requirements in a sorted order, select Sort Block of "Numeric"; and to keep all of the "refined by" requirements in a single row, check the option Single Cell.

Note: When using Sort Blocks in table definitions, Sort Blocks in GENESYS have specific representations associated with them. For example: the "Numeric" sort block lists number and name. (Sort Block definitions



are defined in the GENESYS project). If you use the Numeric sort block and intend to change information in this table and push the information back into GENESYS, then use the Entity Attribute with Name specified to facilitate this feature.

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6		R.2.1	Accept F	Requests from Certifi	ed Customers	The system shall accept information requests from certified customers.						Accept Reque Validate Certil		rs		
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Figure 16 Example of Completed Query

Once the project information has been exported out to the Excel worksheet, the display of the information can be changed using the normal features of Excel. The user can format individual cells and columns much you would with any Excel spreadsheet. The file can also be saved as you would with any Excel file (you do not have to use the .csv format).

Note that Column A of the spreadsheet contains the GENESYS Unique ID number. This information is required in all worksheets as the index to enable moving any changed information back in to the project repository.

1.6 Manipulating Project Data in Excel

With the project data in an Excel worksheet, the user can edit the information in any of the cells. Commonly the project team will extract Requirement information providing the Requirement Name, Description, Type, and Origin. An example of this export is provided below.



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-	BEQ No	Name		Description	Refined by			
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É	n. i. i	Continuous Support		collection systems. CHANGE THIS	h. i. i. i Availability			
3	B.1.1.1	Availability		The system shall be unavailable no more than a total of 10 minutes per month.				
4	R.2	Specific Requirements		1. The system shall accept information requests from certified customers. 2. The system shall retain an invertory of previously collected images/products and provide them to users, if appropriate. 3. The system shall control multiple image collectors and multiple types of image collectors. 4. The system shall be staffed at a maximum of 30 personnel on any shift. 5. The system shall provide feedback on the customer's request within 24 hours. 6. The system shall provide a means of provintizing the customer's requests. 7. The system shall monitor and assess its own performance.	R.2.2 Retain Inventory and Provide Products R.2.2.1 Retain Inventory R.2.3 Control Multiple Collectors and Collector Types R.2.3.1 Control Multiple Collectors			
5	R.2.1	Accept Requests from Ce	ertified Customers	The system shall accept information requests from certified customers.	R.2.11Accept Requests			
6	B.2.11	Accept Requests		The system shall accept information requests.	R.2.1.3 Validate Certified Customers R.2.1.1.1 Accept Media of Reguests			
b H.2.1.1 Accept Hequests 7 R.2.1.1.1 Accept Media of Requests				The system shall accept requests via any of the following media: 1) Hardcopy Forms; 2) Verbal; 3) Phone-verbal; 4) Phone-electronic file; 5) Web-based electronic file.	R.2.1.1.11Media of Requests: Hardcopy Forms R.2.1.1.1.2 Media of Requests: Verbal R.2.1.1.1.3 Media of Requests: Verbal Telephonic			
					R.2.1.1.1.4 Media of Requests: Telephonic Electronic File R.2.1.1.1.5 Media of Requests: Web Services			
-	R.2.1.1.1	Media of Requests: Hard	copy Forms	The system shall accept requests via hardcopy forms.	n. 2. i. i. i. 5 media of Requests: Web pervices			
8	DOMAG	··· · · · · · · · · · · · · · · · · ·		······································				
8	F	Sheet1 (+)						

Figure 17 Excel Spreadsheet with Edited Cells

Changes can now be made to items in the spreadsheet. As changes are made to individual cells, the cell is highlighted in yellow to indicate that the text has been edited. The Excel file can be saved with a different file name.

FILE	HOME	INSERT PAGE LAYOUT F	ORMULAS DATA REVIEW VIEW GENESIS	Ron Kratzke
5	Logout Pr	oject SAMPLE: Ge Table	Publish hanges	
hang	eEv *	$f_x \checkmark f_x$ Specific F	lequirements	
A	8	c	0	E
	REQ N.		Description	Figure Distance Dista
1.1	R1	Continuous Support and Availability	The Geospatial Library shall provide continuous real-time support to the oustomers and the	
	811	Continuous Support	collection systems. The system shall be unavailable no more than 10 minutes per month. The Geospatial Library shall provide continuous real-time support to the outtomers and the	R.1.1.Availability R.1.1.Availability
Ľ.,			collection systems. CHANGE THIS	
2.1	R111	Availability	The system shall be unavailable no more than a total of 10 minutes per month.	
	R2	Specific Requirements	1. The system shall accept information requests hom certified customers 2. The system shall retain an inventory of previously collected imageal produces and provide them to users, if appropriate. 3. The system shall correct multiple image collectors and multiple types of mage collectors. 4. The system shall be raified at a maximum of 30 personnel on any shifts. The system shall be raified at a maximum of 30 personnel on any shifts. The system shall provide feedback on the customer's requests within 24 hours. 5. The system shall provide feedback on the customer's requests. 7. The system shall monitor and assess its own performance.	R 22 Detain Inventory and Provide Products R 22 Thetain Inventory R 32 Convol Multiple Collectors and Collector Types R 23 Ti Convol Multiple Collectors R 24 Mainwan Staff R 25 Provide Feedback R 26 Prioritize Requests R 27 Monitor and Assess Performance
2	R2.1	Accept Requests from Certilled Customers	The system shall accept information requests from certified outtomers.	R 2 11Accept Requests R 2 13 Validate Centiled Customers
1.5	R211	Accept Requests	The system shall accept information requests.	R.2.1.1 Accept Media of Reguests
	R2111	Accept Media of Requests	The system shall accept requests via any of the following media: 11 Hardcopy Forms; 2) Verbal, 31 Phone-werbal, 4) Phone-electronic file; 5) Web-based electronic file.	R 21111 Media of Requests: Hardcopy Forms R 21112 Media of Requests: Verbal R 21113 Media of Requests: Verbal Telephonic R 21114 Media of Requests: Telephonic Electronic File R 21115 Media of Requests: Verb Senices
	R21111	Media of Requests: Hardcopy Forms	The system shall accept requests via hardcopy forms.	and the second second second
1.1			The second se	

Figure 18 Updating GENESYS with Changed Information



When the worksheet is ready to be published back into the project use the "Publish Changes" or "Publish All" command in the ribbon. "Publish Changes" updates just the attributes that have changed, "Publish All" pushes all of the data in the workbook in to GENESYS and overwrites all of the information in the project repository. When publishing changes, there will be a dialog box that pops up to confirm that you want to make changes to the project file, and once completed, a second box which will come up and tell you the number of changes made to the project.

GAINING INSIGHT INTO THE PROJECT THROUGH DASHBOARDS

The GENESYS ribbon has a section entitled "Dashboards." This section provides a set of dashboards which have been coded into the ribbon. The dashboards are intended as a means for the project leadership to get a high level understanding and status of the project repository maturity on a periodic basis. There are currently three dashboards programmed into the Excel Connector: Requirement Management; Program Management; and Test/Evaluation Planning.

1.7 Accessing Dashboard Information

To access a dashboard the user selects the type of dashboard from the drop-down menu, then selects where the dashboard should be displayed (current sheet or new sheet); then selects "Load." The figure below provides an example of the Requirements dashboard.

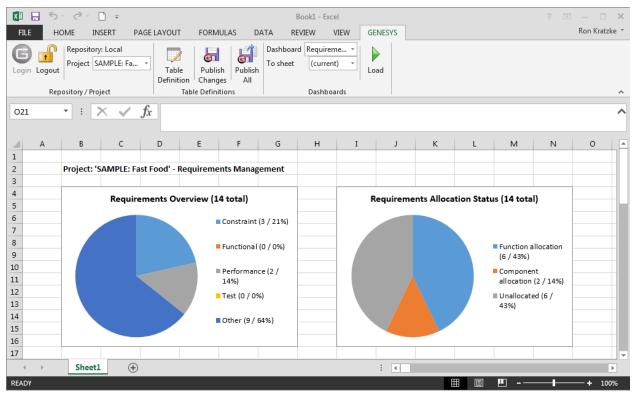


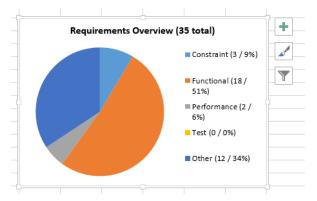
Figure 19 Requirement Dashboard

Each dashboard has several different graphic representations of information extracted directly from the selected project repository. The entire depth and breadth of the data and graphics is not described in this guide - the user is encouraged to explore the dashboards provided.

1.8 Modifying Graphic Displays on the Dashboard

Gathering the data to display on the dashboard is one part of the dashboard solution, displaying the data in unique ways is another part of the dashboard solution. While the data extracted from the project repository is hard-coded into the dashboard, we have provided an initial set of graphical displays which can be altered in Excel to provide enriched presentation.







The user can select a chart, right-click, and use the Excel drop-down menu together with the control buttons to modify the information display. Using these options, the first row of the Requirement Overview pie chart has been modified to the options shown below.

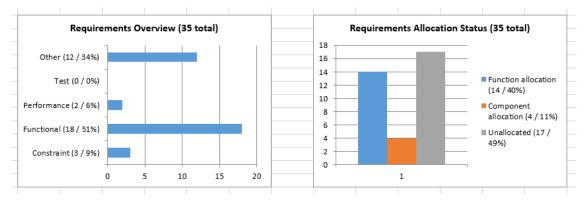


Figure 21 Modified Dashboard Chart Views

We have not provided an exhaustive set of dashboards in the Excel Connector. We encourage users to provide feedback to us with ideas for additional dashboard concepts. Please email us at <u>support@vitechcorp.com</u>. Updates to the Excel Connector functionality and dashboards will be developed and published in service packs for GENESYS.





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