Sage 300 Web Screens SDK

Code Generation Wizard

August 2021

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1. Overview

This document presents instructions for using the Code Generation Wizard to create Sage 300 Web User Interfaces (“UIs”), including screens, reports, inquiries, and so on.

The Code Generation Wizard is a Visual Studio Plugin and is compatible with Visual Studio 2019.

The intent of the wizard is to generate code files in a Sage 300 Web UI solution. The Solution Wizard has already created a solution which provides the necessary scaffolding and structures to accommodate the generated code files by this wizard.

The wizard will create code files in the following projects:

* Business Repository

Contains the code files for the Entity Repositories, Entity Mappers, Menu Navigation XML, Security Constants, and so on.

* Interfaces

Contains the code files for the Entity Repository/Service Interfaces.

* Models

Contains the code files for the Models, Model Enumerations, and Model Fields.

* Resources

Contains the code files for the Resources (Resx files) for supported languages.

* Services

Contains the code files for the Services.

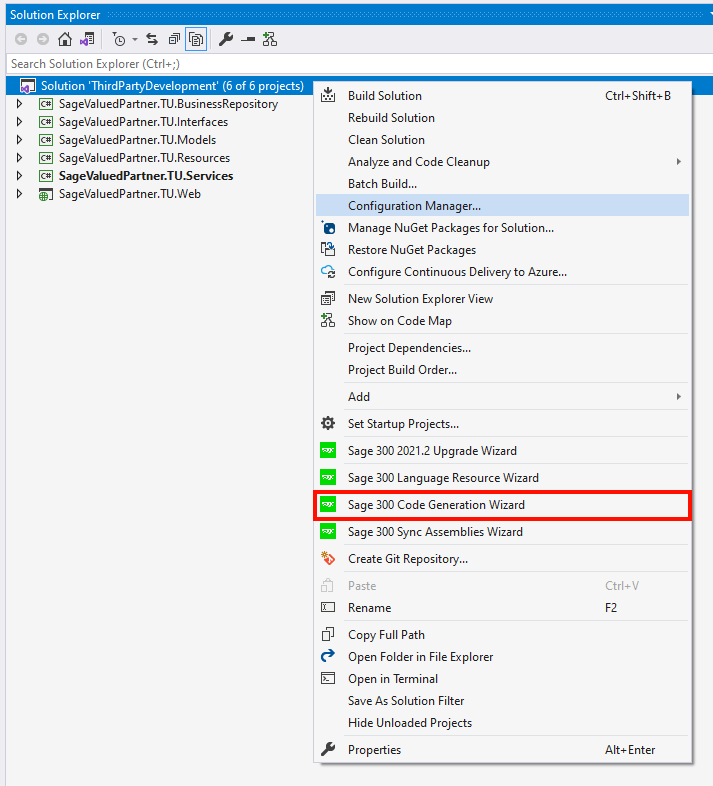
* Web

Contains the standard code files based upon MVC patterns (Controllers, View Models, JavaScript, Razor Views, Configuration files, and so on).

Like the Solution Wizard, this wizard is embedded directly into the Visual Studio IDE.

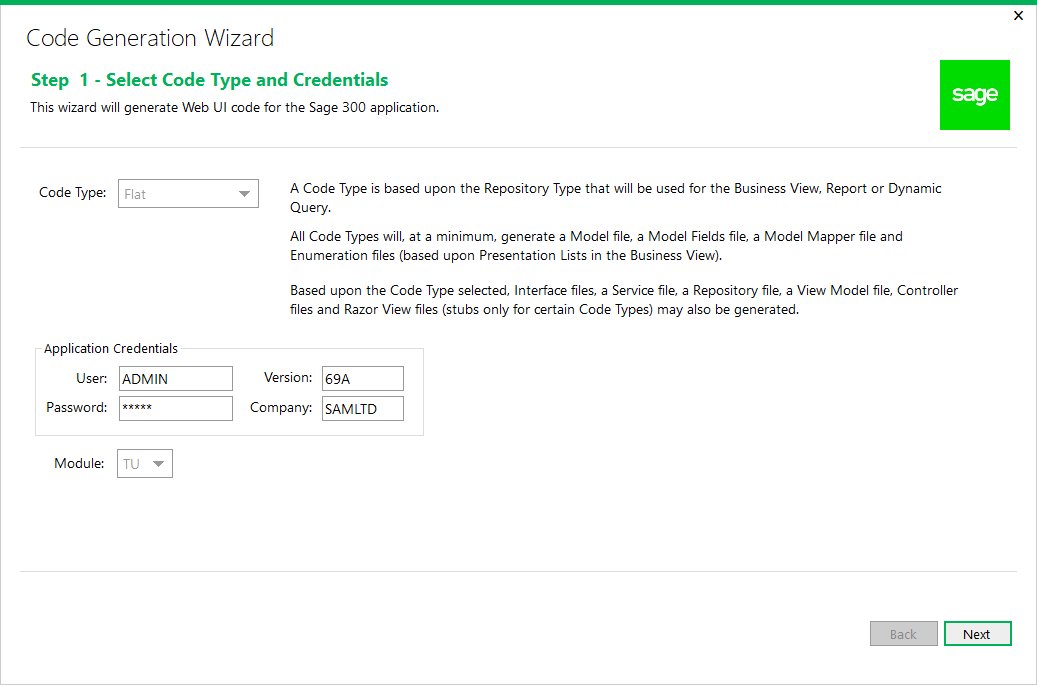
1. Accessing the Code Generation Wizard

The wizard is embedded in Visual Studio as a plugin. To open it, right-click the solution, and on the context menu, click Sage 300 Code Generation Wizard.



The wizard will perform validation to ensure that the invoking solution is a Sage 300 Web UI solution. If it is not (due to the required projects not being present), a message informs you that the solution does not include all required Sage 300 projects.

1. Using Code Generation Wizard
   1. Step 1: Select Code Type and Credentials



Code Types

After the 2022 release, the Dynamic Query and Inquiry code types will be deprecated.

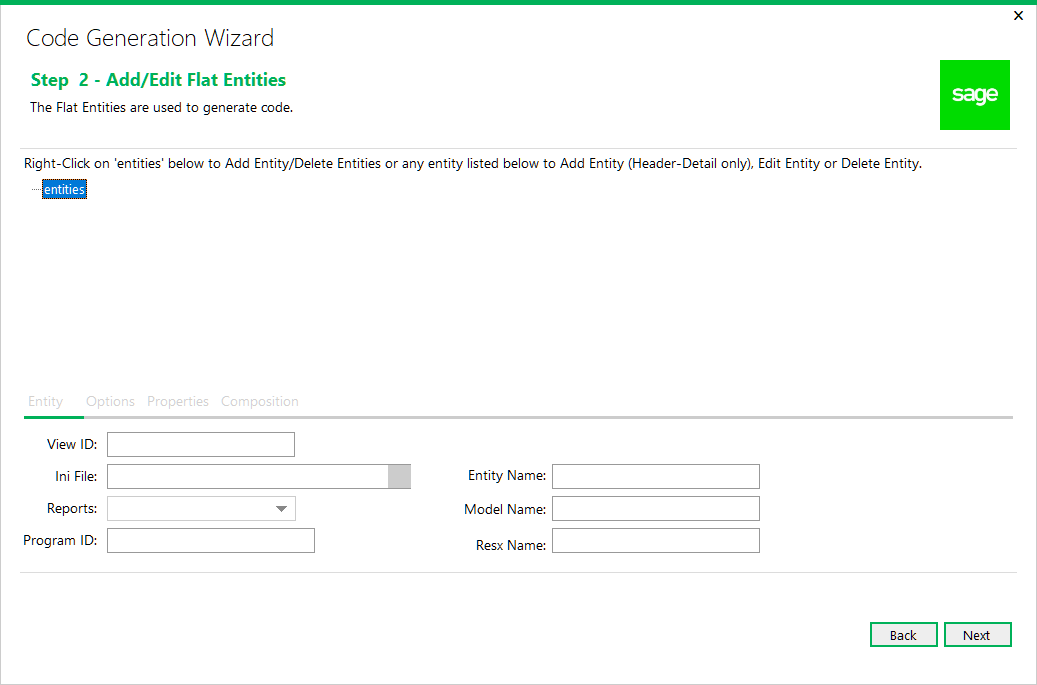
* Flat
* To be used for simple setup screens
* Will use the FlatRepository base class
* Will use a Business View to generate code files
* Process
* To be used for process screens
* Will use the ProcessRepository base class
* Will use a Business View to generate code files
* Dynamic Query
* To be used for SQL statement screens (i.e. KPIs)
* Will use the DynamicQueryRepository base class
* Will use a manually created model to generate code files
* Report
* To be used for reports
* Will use the ReportRepository base class
* Will use a Report INI file to generate code files
* Inquiry
* To be used for inquiry screens
* Will use the InquiryRepository base class
* Will use a Business View to generate code files
* Header Detail
* To be used for screens with business views with a header/detail relationship
* Will use the BaseHeaderDetailRepository base class
* Will use Business Views to generate code files

Application Credentials are defaulted and may be overridden to connect to the Business View.

The Module list contains a list of Modules discovered in the solution. If only one Module is discovered, it is defaulted.

Click Next to proceed.

* 1. Step 2: Add/Edit Entities



As of 2018.1, this step combines the actions for all code types with certain fields and functionality disabled based upon the code type.

The wizard is now able to generate multiple entities which is required to support the header detail code type. Only the header detail code type allows for hierarchical entities to be created.

Right-click on the ‘**entities**’ tree node and select **Add Entity** to add a new entity or select **Delete Entities** to delete all entities already added. If the code type is **HeaderDetail**, select **Edit Container Name** to display a dialog for specifying the name of the container for the header detail entities (i.e. Receipt for a Receipt Entry screen).

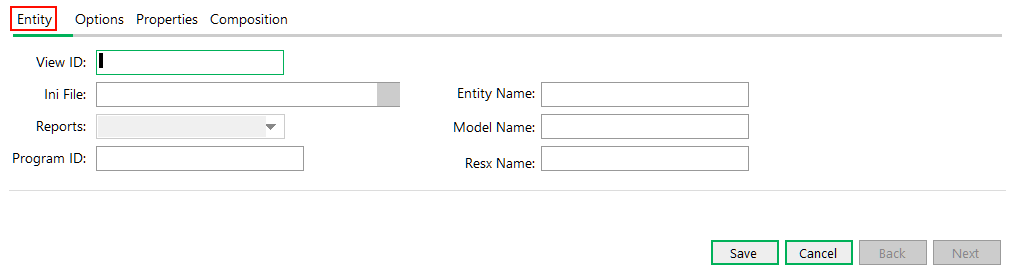
Right-click on **{entity}** in the tree and select **Edit Entity** to edit an already added entity.

Right-click on **{entity}** in the tree and select **Delete Entity** to delete an already added entity.

If the code type is **HeaderDetail**, child entities may be added by right-clicking on **{entity}** in the tree and select **Add Entity**.

Click Next to proceed or Back to go back to the previous step.

* + 1. Entity Tab

****

The Entity Tab has properties specific to the entity:

**View ID**

If the code type is **Report**, the generation of the code files are based upon a Sage 300 report definition from an INI file. Therefore, the View ID is a randomly generated static GUID and the field is disabled.

If the code type is **DynamicQuery**, the **View ID** is associated with a generic Business View (CS0120), which allows a SQL query to be submitted to the Business View for data retrieval. Therefore, the View ID field is disabled.

When editing an entity, the field is disabled.

Upon selecting a View ID, the Application Credentials from the previous step will be used to access the Business View and the **Entity** Name, Model Name and Resx Name will be defaulted. These may be overridden but the Resx Name must have the “Resx” suffix.

**Ini File**

If the code type is **Report**, Report definitions for Sage 300 are in INI files. Click on the magnifying glass button to display an Open File dialog to search for an existing INI file, or enter the file name manually.

**Reports**

If the code type is **Report**, this list is populated from the INI file. It contains the report names in alphabetical order. The report name selected will be used to populate the Model Fields grid in the Properties tab.

Program ID

If the code type is **Report**, this field is assigned from the INI file and will be used in the Model Mapper class.

**Entity Name**

This field is defaulted from the retrieved Business View and may be overridden as required. It is used as the prefix name for the code files that will be created. For **DynamicQuery** and **Report** code types, this field must be manually entered as there is no source to default it from.

**Model Name**

This field is defaulted from the retrieved Business View and may be overridden as required. It is used as the name for the model that will be created. For **DynamicQuery** and **Report** code types, this field must be manually entered as there is no source to default it from.

If the code type is **DynamicQuery**, a Model Mapper file will not be generated as mapping is an abstract function of the repository class. Also, the Model Fields class will only have an Index class and not a Fields class as these model properties will only be referenced by index.

**Resx Name**

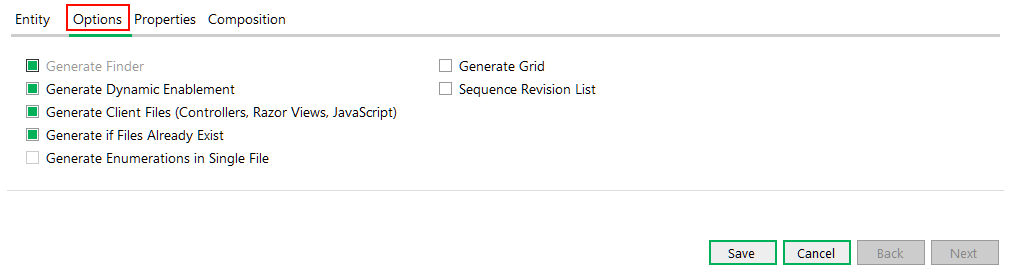
This field is defaulted from the retrieved Business View and may be overridden as required. It is used as the name for the Resx file that will be created. For **DynamicQuery** and **Report** code types, this field must be manually entered. It has a requirement that it must have the “Resx” suffix. This field will also be synchronized with any changes made to the entity name.

Up to five Resx files will be generated based upon the languages selected in the Solution Wizard. The main Resx file is English and will contain the descriptions for the Model properties and Enumerations from the Business View.

The other Resx files, if selected in the Solution Wizard, are Spanish (es), French (fr), Chinese Simplified (zh-Hans) and Chinese Traditional (zh-Hant). These files will contain only keys and will require manual translation.

When done adding or editing an entity, click **Save** to save the entity when finished or **Cancel** to disregard any changes.

* + 1. Options Tab

****

The Options Tab has options specific to the entity:

**Generate Finder**

If selected, this option will generate a finder for the entity. Certain code types have this option disabled as a finder is not applicable to all code types.

Generate Dynamic Enablement

If selected, this option provides a reverse mapping of the Business View fields. Within the Sage accounting modules, the Inventory Control, Order Entry, and Purchase Orders Business Views contain more functionality for determining if a field is editable or not. This will generate the code for determining if the UI or Business View is responsible for checking the editable state. Certain code types have this option disabled.

Generate Client Files

If selected, this option will generate the client files for a Business View (controllers, Razor Views, and JavaScript files) and thus provides for the ability to generate certain code files without the client files being generated. Certain code types have this option disabled.

Generate if Files Already Exist

If selected, this option provides a warning dialog if a code file to be generated already exists. The developer may choose to override an existing file, skip the file from being generated, or exit the wizard all together.

Generate Enumerations in Single File

If selected this option will generate all enumerations in a single file instead of in individual files.

This option is not yet enabled and is for future use.

Generate Grid

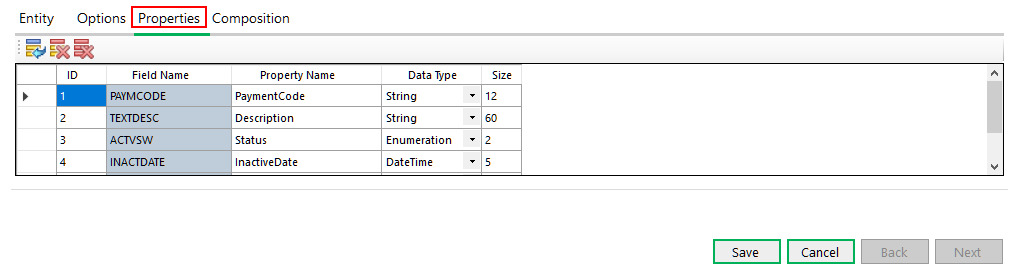
[TODO] This is the description text for the ‘Generate Grid’ checkbox.

Sequence Revision List

[TODO] This is the description text for the ‘Sequence Revision List’

When done adding or editing an entity, click **Save** to save the entity when finished or **Cancel** to disregard any changes.

* + 1. Properties Tab

****

The Properties Tab has the fields that are associated with the Business View.

The above screenshot shows properties for the **AR0012** Business View.

For **DynamicQuery** and **Report** code types, this information must be manually entered.

For all other code types that use a Business View for the View ID, this grid allows for the modification of the Property Name before the code is generated. This can be very useful if the default names are not sufficient or the developer wishes to use another name. Additionally, fields may be added or deleted as required by the developer to add fields to the model that are not found in the Business View.

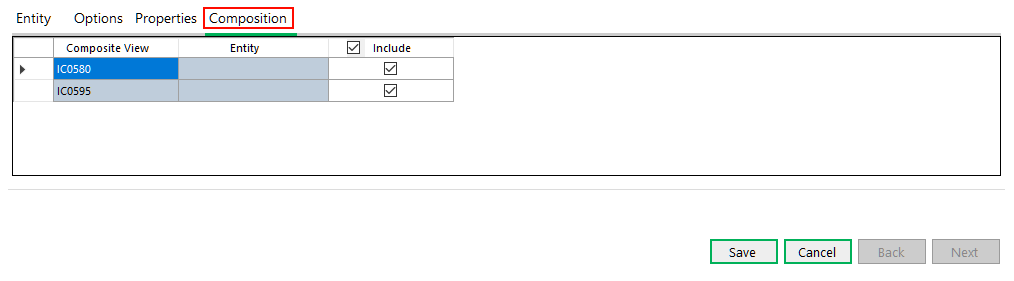
If the code type is **DynamicQuery**, the order of the properties is important and must match the columns returned by the SQL query. The Size column is used for the Display annotation on the Model property and for the Finder attributes if the option to generate a Finder is selected.

If the code type is Report, the Field Name column is read-only and is the server field name whereas the Property Name column is the name for the model properties. A simple algorithm will be applied to the property name column based upon the server field name. The Size column is used for the Display annotation on the Model property and for the Finder attributes if the option to generate a Finder is selected.

All properties are defined as String data type based upon the requirements of the report engine.

When done adding or editing an entity, click **Save** to save the entity when finished or **Cancel** to disregard any changes.

* + 1. Composition Tab

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The Composition Tab has the compositions that are associated with the Business View.

This tab is only available if the code type is **HeaderDetail**.

The above screenshot shows compositions for the **IC0590** Business View.

The compositions are defaulted to be included and these should be included for any header entities.

The **Include** option, if selected, will ensure that the **Composite View** is associated with an entity specified in the list of entities. Once a Composite View has been specified in the list of entities, the Entity will be assigned from the **Entity Name** field of that entity. The validation logic will ensure this functionality.

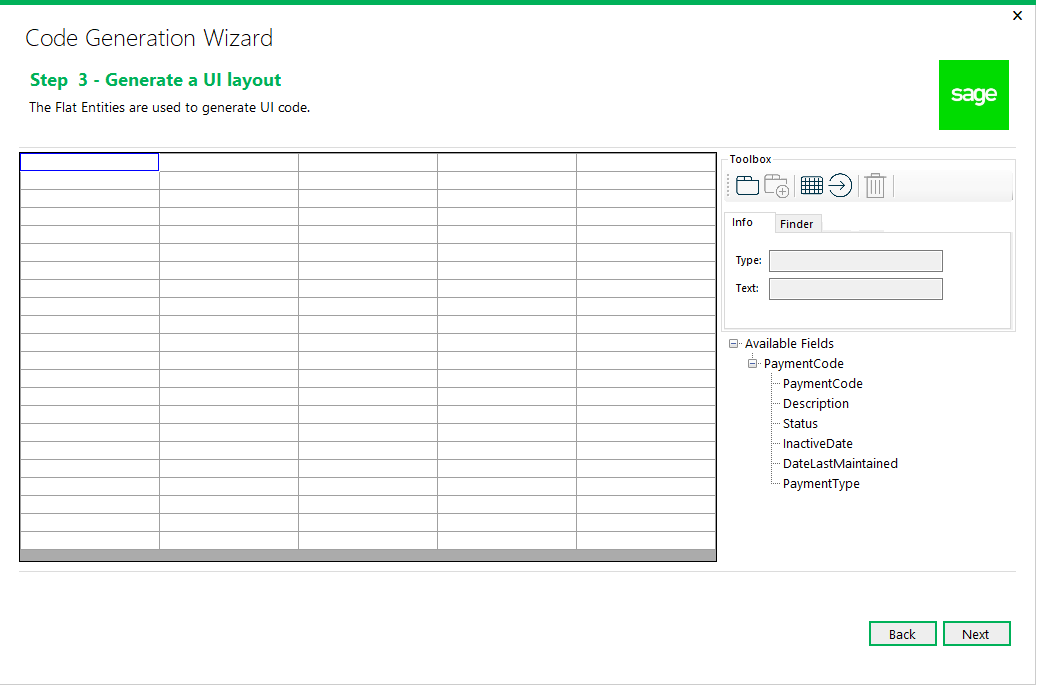
The **Include** option, if not selected, will not require the entity to be in the list of entities while still allowing the composition code to assign a Null value to the entity in the composition routine. In the above **IC0590** example, when adding the child to this entity (**IC0595**), there will be numerous Composite Views specified, however, not all should be included.

Refer to the Receipt Sample in the Sage 300 Web SDK for the composition routine generated by the wizard.

Familiarity with the compositions is a requirement for the developer using the **HeaderDetail** code type.

When done adding or editing an entity, click **Save** to save the entity when finished or **Cancel** to disregard any changes.

* 1. Step 3.1: Generate a UI Layout

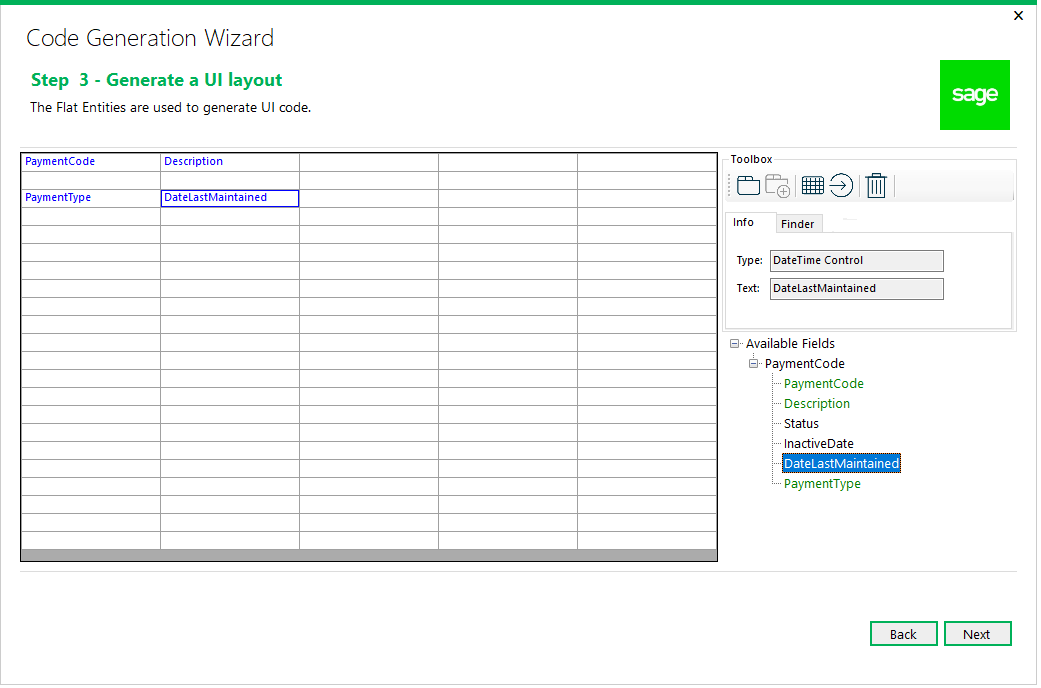


For the 2022.0 release, a new step has been added to the Code Generation Wizard. This step, entitled ‘Generate a UI layout’ is used to visually layout the controls that will make up the page.

For the 2022 release, only the Flat and Header-Detail code types will be able to create a tab, a grid, and/or buttons. The other code types will have this functionality enabled in a subsequent release.

Click Next to proceed or Back to go back to the previous step.

* 1. Step 3.2: Generate a UI Layout



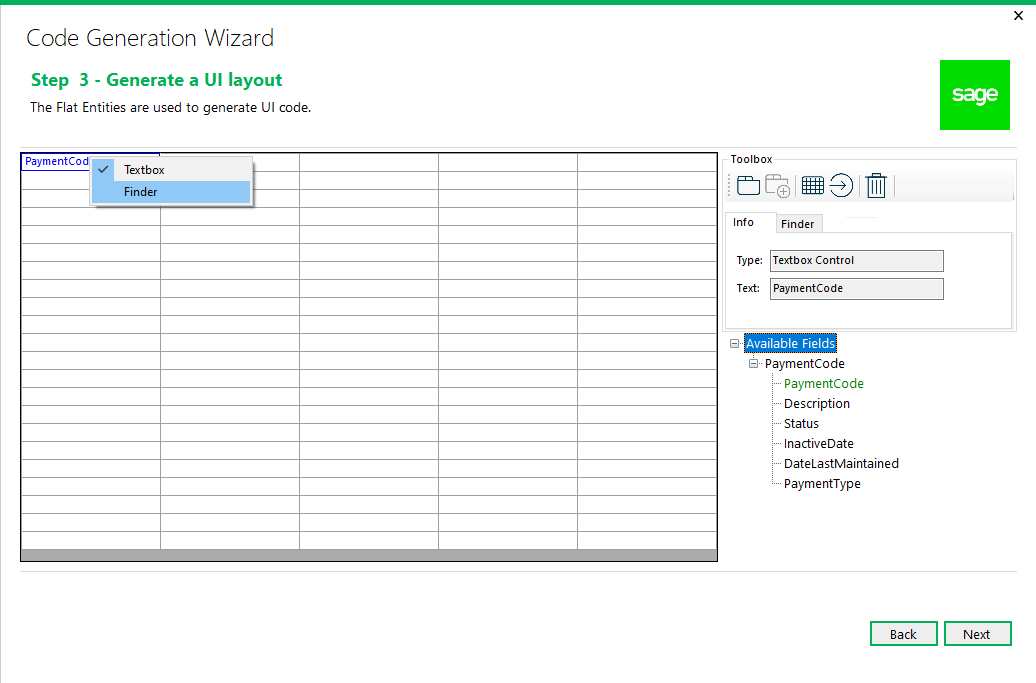
Fields may be dragged onto the layout canvas from the **Available Fields** tree control in the bottom-right corner of the wizard.

The field may only be dropped onto an open cell in the palette.

The field may be moved (dragged) to any other open cell in the palette.

Once the field is dropped onto the palette, it may not be dropped more than once.

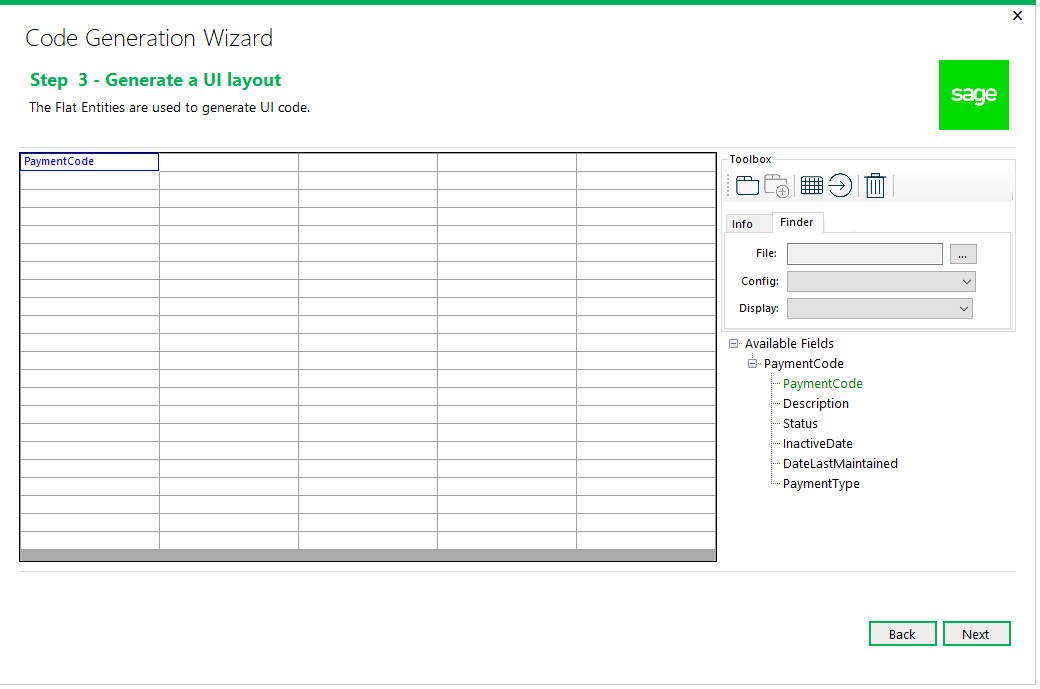
To delete a field from the palette, click on the field in the palette and selected the Trash icon in the toolbox to delete the field and return it to the list of Available fields.



Each field on the canvas may be able to have its properties manipulated via a combination of right-clicking on the dropped field in the layout canvas and property modifications in the Info | Finder property area.

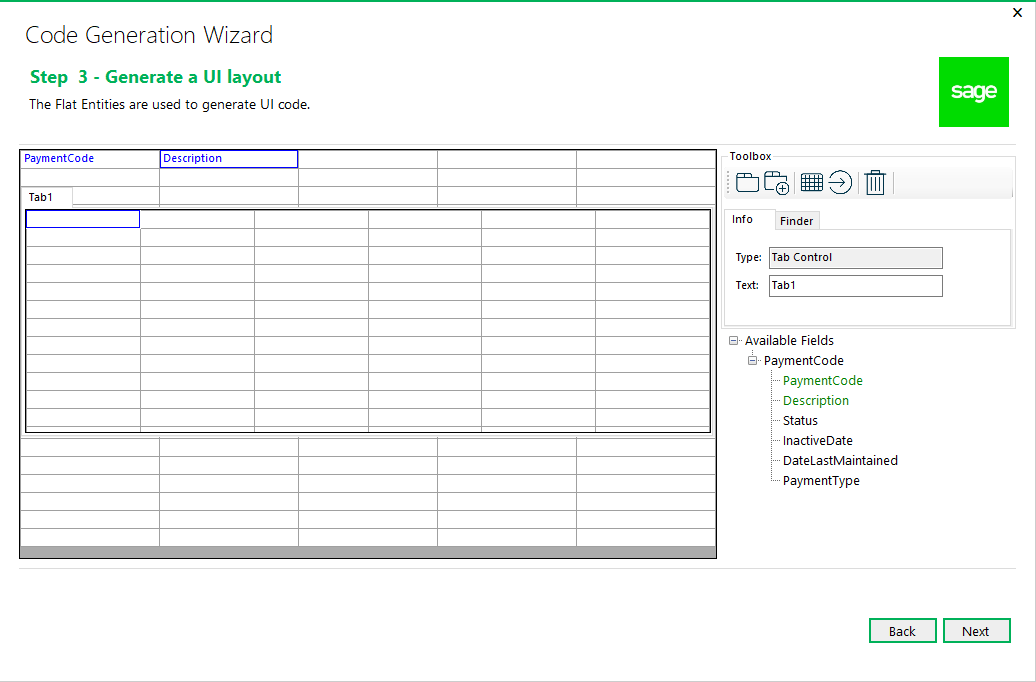
The UI Layout wizard does not know what fields are to be considered finders. Therefore, by right-clicking on a field that is assigned a textbox, you will be able to change the widget that will be created to be that of one that supports a finder.

A field with a presentation list will default to a Dropdown widget, but by right-clicking on the field, you will be able to change this to a Radio Button widget.



If a field is selected to be a finder, the “Finder” tab is enabled, and a configuration file may be selected as well as a finder definition.

Finder definitions MUST be defined prior to the code generation process by using the Finder Definition Generator. See the SDK for documentation. This is a new requirement introduced in 2022 as previously the finder definition was simply generated inline in the Behavior JavaScript file.



If a tab widget is required for the screen, select the Tab Control icon in the toolbox and drag it onto the palette. The text for the tab page can be changed in the Info section’s text field.

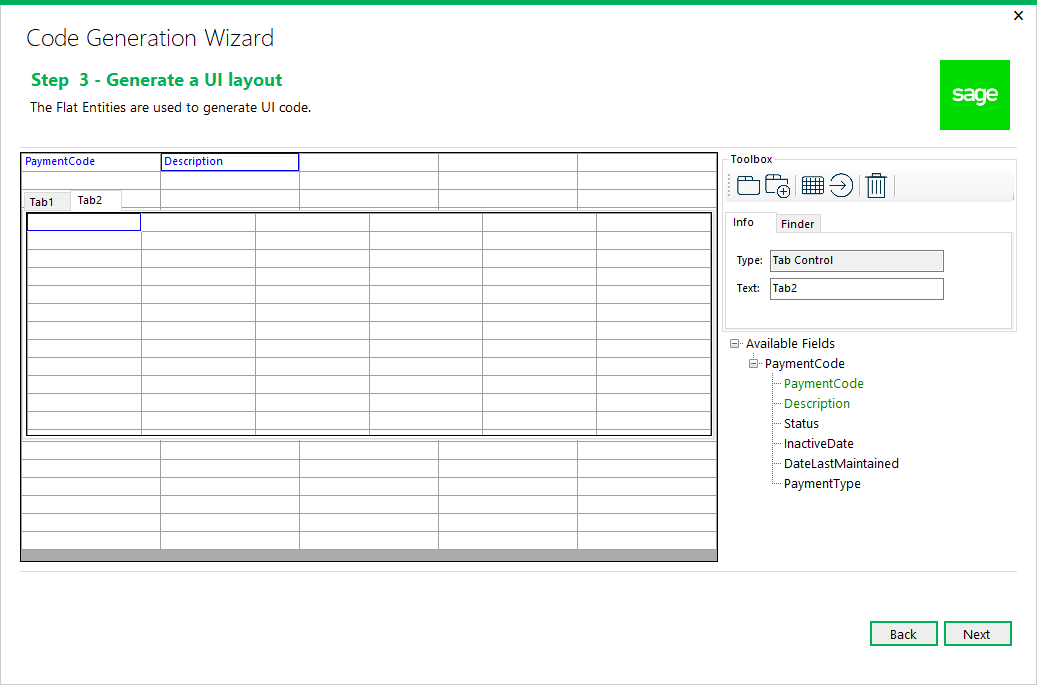
This value is added to the Resx file for localization.

Only 1 tab control per screen is allowed in the wizard, however, more may be created manually.

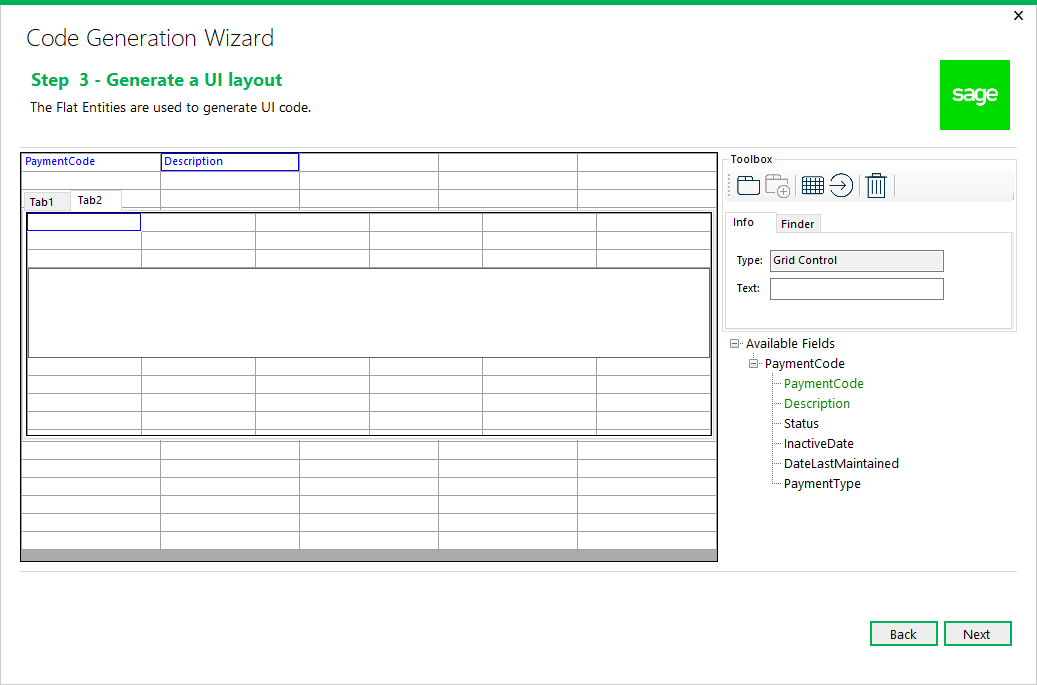
The tab control can only be dropped on an open cell.

The tab control may be moved (dragged) to any other open cell in the palette.

To delete a tab page (and control if only 1 tab page) from the palette (and any fields dropped onto the palette in the tab page), click on the tab page in the palette and selected the Trash icon in the toolbox to delete the tab page and return any fields to the list of Available fields.



If another tab page is required for the screen, click the Add Tab Page Control icon in the toolbox and another tab page is added to the tab control in the palette. The text for the tab page can be changed in the Info section’s text field.



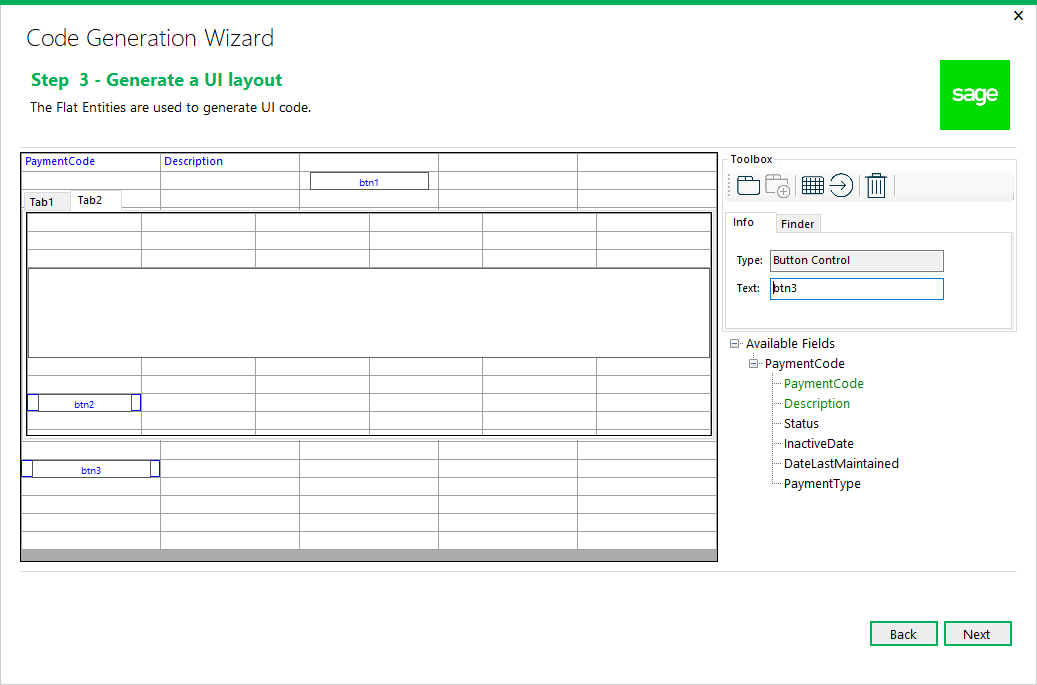
If a grid widget is required for the screen, select the Grid Control icon in the toolbox and drag it onto the palette. The name for the grid can be changed in the Info section’s text field and will be used as the name of the grid.

The grid control can only be dropped on an open cell.

The grid control may be moved (dragged) to any other open cell in the palette.

To delete a grid from the palette (and any fields dropped onto the grid), click on the grid in the palette and selected the Trash icon in the toolbox to delete the grid and return any fields to the list of Available fields.

Fields dropped into the grid control are ordered from left to right and at this time, we do not allow for inserting or re-ordering. Therefore, if reordering is required, simply delete the fields and re-drop.



If a button is required for the screen, select the Button Control icon in the toolbox and drag it onto the palette. The text for the button can be changed in the Info section’s text field.

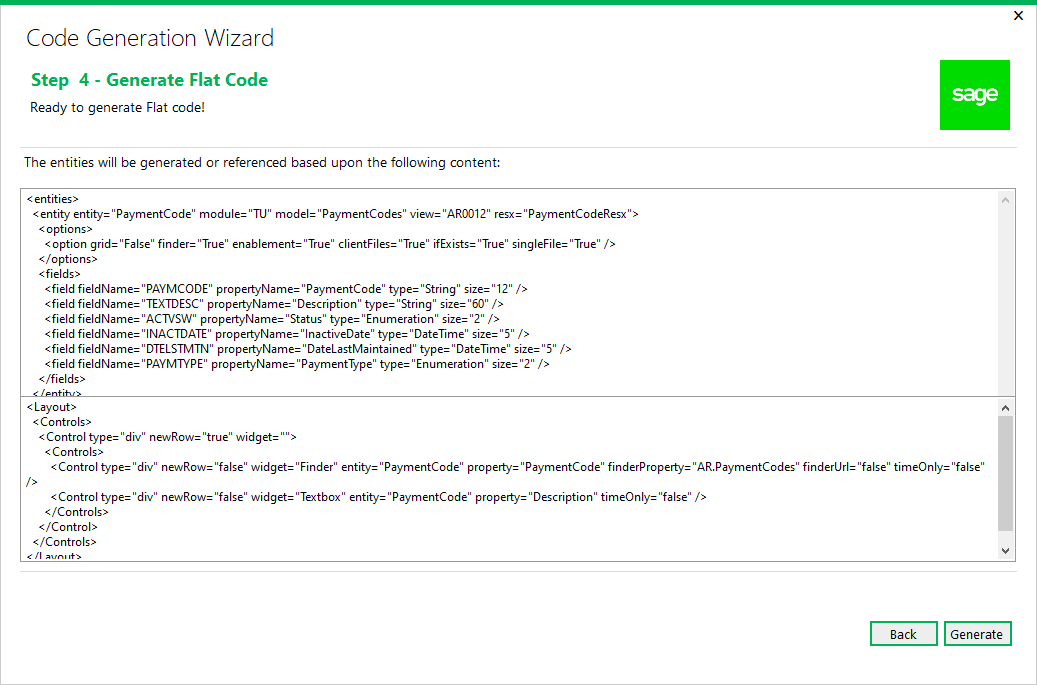
The button control can only be dropped on an open cell.

The button control may be moved (dragged) to any other open cell in the palette.

To delete a button from the palette, click on the button in the palette and selected the Trash icon in the toolbox to delete the button.

Click Next to proceed or Back to go back to the previous step.

* 1. Step 4: Generate Code



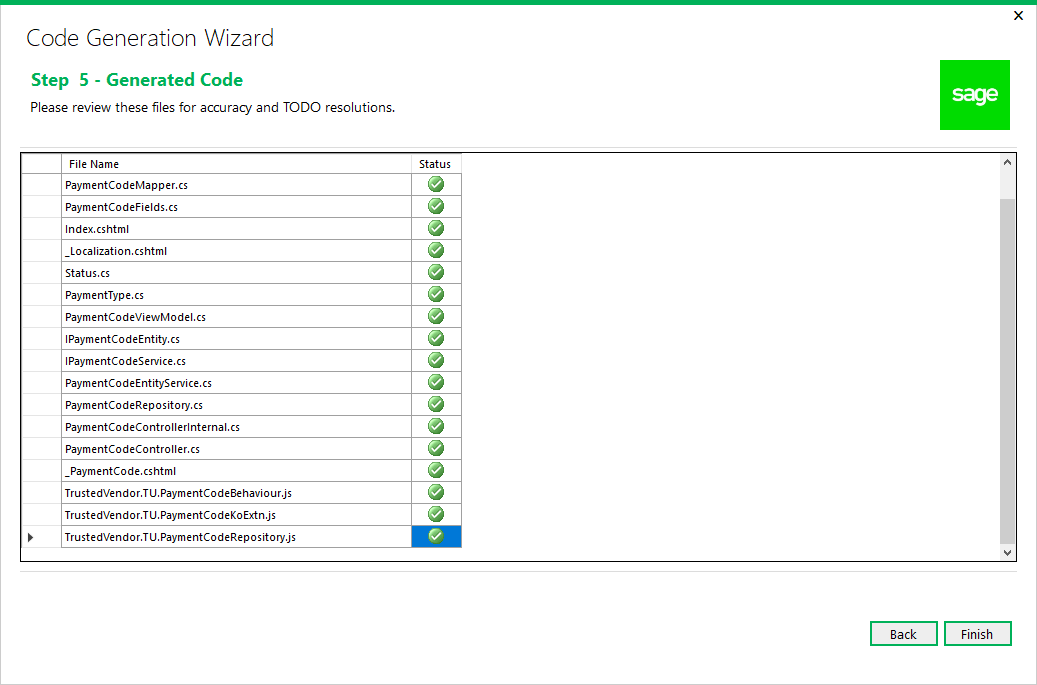
This is the confirmation prior to the wizard generating the code based upon the wizard inputs.

The wizard will generate code based on the XML shown in the preview.

If the UI Layout step specified a layout, the razor view will create the appropriate widgets and required JavaScript code to support the widgets.

Click Generate to proceed or Back to go back to the previous step.

* 1. Step 5: Generated Code



The wizard displays the code files that were generated. It is now time to review the generated files for accuracy and resolve any TODO issues.

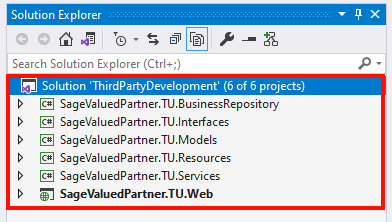
TODO issues are C# comments (i.e. // TODO something…) that provide explicit instructions for a developer to resolve or verify wizard generated code.

Click Finish to exit the wizard or Back to go back to the previous step.

1. Examining the Solution

It is time to examine the solution and get familiar with the class and folder scaffolding.

* 1. Solution Explorer



Note the following information:

* The solution name supplied in the New Project dialog.
* The namespace of the projects supplied in the wizard dialog.
  1. Business Repository Project



The wizard has created the required folders and a couple of classes that will be used by the Code Generation Wizard.

Note the presence of the Process and Reports folders. In the Code Generation Wizard, if a Code Type of Process or Reports is selected, the appropriate Mapper and Repository class will be generated in these subfolders as opposed to the root folders.

The TUMenuModuleHelper.cs file already has generated code for Menu Navigation.

The Security.cs file already has constants generated for the Import and Export constants for the generated Module ID.

* 1. Interfaces Project



The wizard has created the required folders that will be used by the Code Generation Wizard.

Note the presence of the Process and Reports folders. In the Code Generation Wizard, if a Code Type of Process or Reports is selected, the appropriate Interface classes will be generated in these subfolders as opposed to the root folders.

* 1. Models Project



The wizard has created the required folders that will be used by the Code Generation Wizard.

Note the presence of the Process and Reports folders. In the Code Generation Wizard, if a Code Type of Process or Reports is selected, the appropriate Enumerations, Fields and Model classes will be generated in these subfolders as opposed to the root folders.

* 1. Resources Project



The wizard has created the required folders that will be used by the Code Generation Wizard.

Note the presence of the Forms, Process, and Reports folders. In the Code Generation Wizard, if a Code Type of Process or Reports is selected, the appropriate Resx files will be generated in these subfolders as opposed to the Forms folders.

Note the generated Resx files:

* MenuResx.resx is the English resource.
* MenuResx.es.resx is the Spanish resource, if Spanish is included via the Solution Wizard Resource Files Step.
* MenuResx.fr.resx is the French resource, if French is included via the Solution Wizard Resource Files Step.
* MenuResx.zh-Hans.resx is the Chinese Simplified resource, if Chinese Simplified is included via the Solution Wizard Resource Files Step.
* MenuResx.zh-Hant.resx is the Chinese Traditional resource, if Chinese Traditional is included via the Solution Wizard Resource Files Step.

Only the English Resx file is marked as Public. All other resx files are marked as No Code Generation.

Any Resx file that is common to all screens/reports/whatever in a module is to be placed in the root folder.

* 1. Services Project



The wizard has created the required folders and a class that will be used by the Code Generation Wizard.

Note the presence of the Process and Reports folders. In the Code Generation Wizard, if a Code Type of Process or Reports is selected, the Service class will be generated in these subfolders as opposed to the root folders.

The TUBootstrapper.cs file already has generated code for Unity Dependency Injection which will be added to by the Code Generation Wizard.

* 1. Web Project



The wizard has created the required folders, files and classes that will be used by the Code Generation Wizard.

Note the presence of the Finder, Process, and Reports folders. In the Code Generation Wizard, if a Code Type of Process or Reports is selected, the appropriate classes will be generated in these subfolders as opposed to the root folders. If selected in the Code Generation Wizard Options, the Finder will be created in the Finder folder.

The TUBootstrapper.cs, TUAreaRegistration.cs, TUMenuDetails.xml and TUWebBootstrapper.cs files already have generated code for Unity Dependency Injection, which will be added to by the Code Generation Wizard.