

OBA Composition Reference Toolkit –User Guide

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About This Guide

Purpose of This Guide

This document is intended to serve as a user guide for composing and deploying OBAs using the OBA Composition Reference Toolkit.

Prerequisite Reading

It is recommended that you read the OBA Composition Reference Toolkit Overview document before reading and walking through the exercises in this document.

Overview

The OBA Composer application included in the OBA Composition Reference Toolkit is used to compose and deploy OBAs using components and LOB adapters registered in an OBA Composition Server.

The following are the three simple steps to compose and deploy an OBA using the OBA Composer:

1. Establish a connection to an OBA Composition Server.
2. Search for, browse, and select semantically related components to compose an OBA definition.
3. Save, provision, and execute the composed OBA.

This guide will walk you through the process of composing and deploying an OBA by executing the preceding steps using the OBA Composer.

Fundamental Concepts

Familiarity with the following fundamental concepts is required to understand the process of composing and deploying OBAs using the OBA Composer.

Components

Components are the building blocks of OBAs composed using the OBA Composer. There are three types of components that can be registered in an OBA Composition Server and used to compose OBAs:

- **Presentation components.** These are used to generate the user interfaces of OBAs. Examples of presentation components include Visual Studio Tools for Office Add-ins for the Microsoft Office applications, SharePoint portal pages, Web Parts, and reports.
- **Collaboration components.** These are used to model unstructured artifacts and enable unstructured information worker collaboration. Examples of collaboration components include SharePoint workflows, SharePoint document libraries/lists, and content types.
- **Domain model components.** These are used to model abstracted business data models used for line-of-business application integration and business intelligence. Examples of domain model components

include BDC application definitions, SQL Server Reporting Services Report Models, and SQL Server Analysis Services UDM Models.

Component Relationships

Component relationships are defined to establish semantic relationships between components registered in an OBA Composition Server. These relationships are used in the OBA Composer to prescriptively guide a user through navigating semantic relationships between components and selecting related components while composing an OBA. There are three types of component relationships that can be established between components:

- **Related.** This type of relationship is used when the components add functional value to each other but do not have a hard dependency on each other. An example of a related relationship is an Online Analytical Processing (OLAP) report that can present aggregated business intelligence (BI) view of transactional data collected in a Microsoft Outlook form region.
- **Supporting.** This type of relationship is used to model hard dependencies between components. An example of a supporting relationship is a Web part that supports a Web part page.
- **Associated.** This type of a relationship is used when two components that do not have a hard dependency on each other need to be physically linked to enable additional composite functional value. An example of an associated relationship is a workflow that can be associated to a document library.

Relationships between components can be explicitly defined using the component management administration module (for more information, see the Administrator's Guide). The OBA Composer will also detect and present implicit relationships between components based on common [tags](#) and [LOB adapters](#).

Component Permissions

Component permissions govern the ability of a user to browse and use components when composing OBAs using the OBA Composer. Component permissions are configured by the administrator using the Component Management administration module; the permissions flow seamlessly to the OBA Composer to enable a prescriptively secure OBA composition user experience.

The following are the per user permissions that be configured for a component:

- **Browse.** This permission allows the user to view the component in search results and can view information about the component.
- **Compose.** This permission allows the user to view information about a component and use the component to compose OBAs.

LOB Adapters and Adapter Instances

Line-of-business (LOB) adapters are data source abstractions that integrate components with line-of-business data sources and services. One or more LOB adapter instances materialize an LOB adapter to enable integrating with specific semantically compliant instances of an adapter. For example, a customer relationship management (CRM) LOB adapter can establish a common semantic interface for integrating customer relationship data and

can have Microsoft Dynamics CRM and Siebel CRM adapter instances to enable integrating physical CRM data from two different CRM systems that implement the common semantic interfaces.

This is a powerful concept because it enables reusing components against multiple LOB data sources that are semantically similar.

LOB Adapter/Adapter Instance Permissions

LOB adapter and adapter instance permissions govern the rights that a user has to read/write LOB data using an LOB adapter/adapter instance. The following user permissions can be configured for an LOB adapter/adapter instance:

- **Read.** This permission allows a user to read LOB data using the LOB adapter/adapter instance.
- **Write.** This permission allows a user to write LOB data using the LOB adapter/adapter instance.

These are “high granularity” permissions and do not encompass lower-level granular permissions that control the subsets of LOB entities and attributes that a user can or cannot access. The lower-level permissions are assumed to be configured at the level of a physical LOB adapter instance. These “high granularity” permissions are used to define at a high level the access rights that a user has to an LOB system/system instance registered in an OBA Composition Server using an LOB adapter/adapter instance.

A user does not directly interface with an LOB adapter/adapter instance. User access to LOB adapters/adapter instances are mediated by components that the user selects and uses to compose an OBA using the OBA Composer. LOB adapter/adapter instance usage permissions can also be configured at the level of a component, and an aggregation of the permissions at the component level and user level is used to integrate additional and derived prescriptive security in the OBA composition user experience enabled by the OBA Composer. For example, a user who has only “read” access to an LOB adapter will not be able to use a component that requires “write” access to the adapter.

Semantic Tags

Tags can be used to mark up components and OBAs to facilitate user searching and discovery. Tags are grouped into categories known as tag types. An example of a tag type is Industry. Examples of tags added to Industry tag type include Manufacturing, Financial Services, and Health & Life Sciences.

The OBA Composition Reference Toolkit’s metadata can be extended and customized to incorporate custom tag types and tags.

Provisioning

Provisioning is the process of deploying an OBA composed using the OBA Composer to a SharePoint farm. Provisioning an OBA results in the creation of a SharePoint site for the application. A SharePoint site is the epicenter of OBA—it is composed and deployed using the OBA Composer. It serves as the container for all the OBA components of pertinence to an OBA (including VSTO add-ins for Office applications).

User

A user should be a Windows Active Directory service user registered in the OBA Composition Server as a user with permissions to compose and deploy OBAs using the services and tools enabled by the OBA Composition Reference Toolkit.

The OBA Composer UI Shell

Figure 1 illustrates a screen shot of the user interface (UI) shell of the OBA Composer application.

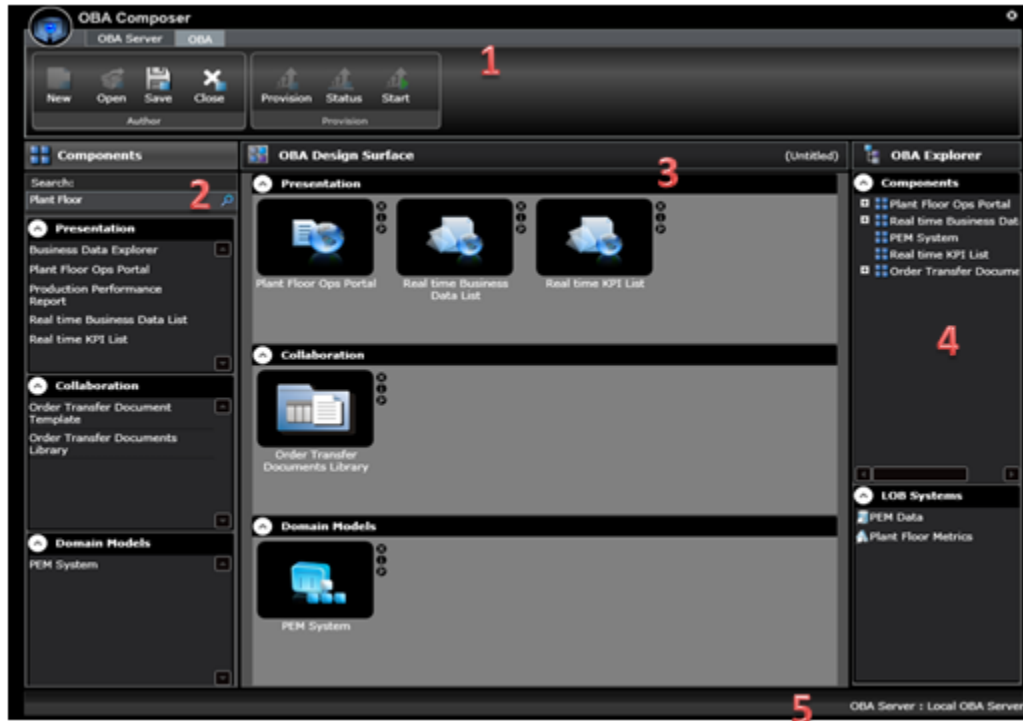


Figure 1: The OBA Composer UI shell

The OBA Composer is a Windows Presentation Foundation (WPF) rich client application used to compose and deploy OBAs. Its UI shell has four sections/areas labeled in Figure 1; the next sections briefly describe each of these sections. Later sections describe the use of these UI elements and will walk you through composing and deploying OBAs using the OBA Composer.

1. Ribbons

The ribbons at the top of the user interface enable the invocation of contextual actions that users can perform when using the OBA Composer.

The OBA Server Ribbon contains ribbon buttons that can be used to invoke actions to connect to and disconnect from an OBA Composition Server.

The OBA Ribbon contains ribbon buttons that can be used to invoke various contextual actions of pertinence to composing and deploying OBAs.

2. Components Explorer

The Component Explorer can be used to browse and search for components registered in an OBA Composition Server while composing OBAs.

3. OBA Design Surface

The OBA Design Surface is used to reflect component selections made by a user while composing an OBA. Components selected by a user are added to the appropriate layers on the design surface based on their type.

4. OBA Explorer

OBA Explorer is a tree view rendering of the components (including relationships between the components) and a listing of the LOB adapters, referenced by the OBA being actively composed.

5. Status Bar

The status bar displays the name of the OBA Composition Server to which the OBA Composer instance is connected. The status bar can be customized/extended (by customizing/extending the source code of the OBA Composer application) to include other status information of pertinence to the user session and the OBA being composed.

Composing and Deploying an OBA using the OBA Composer

In this section, you will walk through the process of incrementally composing and deploying an OBA of relevance to drug research operations in a life sciences organization, using the OBA Composer and the services enabled by the OBA Composition Server.

Connecting to an OBA Composition Server

The first step in composing an OBA using the OBA Composer is to establish a connection with an OBA Composition Server. From a user perspective, an OBA Composition Server serves the dual purposes of a repository of components and LOB adapters that can be used to compose OBAs and a provider of services that can be used to search for components and provision composed OBAs.

Start the OBA Composer application (to do this, click **Start**, point to **All Programs**, point to **OBA Composition Reference Toolkit V2**, and then click **OBA Composer**) and wait for the UI shell to load up.

On the OBA Server Ribbon, click the **Connect** ribbon button to launch the **Connect to Server** dialog box (illustrated in Figure 2). Select or specify an OBA Composition Server. When specifying an OBA Composition Server name, use the <Server name>:<port> format to specify the server and port where the OBA Composition Server is installed. Click the **Connect** button to establish the connection. You must be a registered user in the specified OBA Composition Server to be able to connect to it. Upon a successful connection, you will see the server name displayed in the status bar and the UI setup to enable the composition of a new OBA.

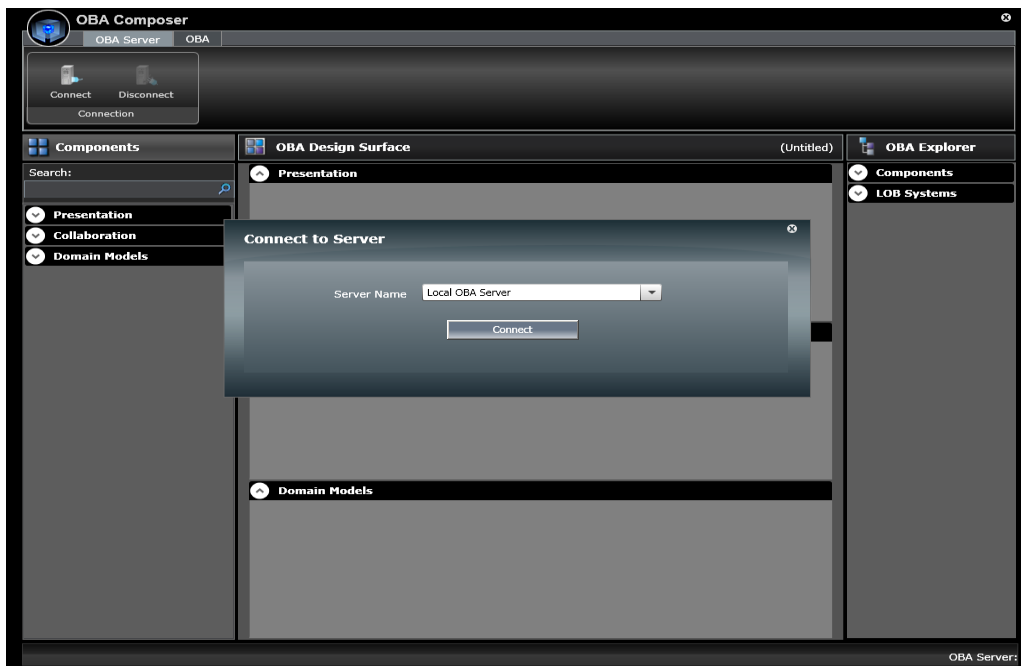


Figure 2: Connect to Server dialog box

Searching and Browsing Components

You can use Component Explorer to search for and browse components.

Clicking the **Search** button in Component Explorer without specifying any search keywords will retrieve and list all components registered in the OBA Composition Server. Figure 3 illustrates the search panel listing the components registered in an OBA Composition Server.

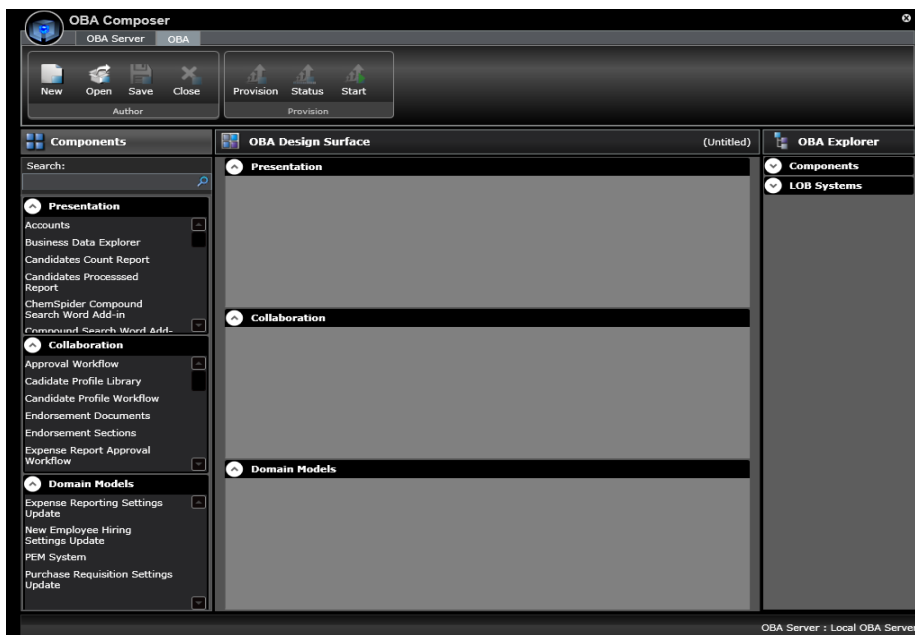


Figure 3: Screen that lists all components after they are retrieved

Some components in the list may have a red lock icon displayed beside their names. This indicates the lack of user permissions to use the component while composing OBAs. The user permissions defined by IT administrators are seamlessly surfaced in the OBA Composer, thereby ensuring a prescriptively secure user experience where users have the flexibility to self compose and deploy OBAs while adhering to the security and governance policies implemented by IT. Figure 4 illustrates the prescriptively secure user experience in the OBA Composer. In this example, a user is notified that he/she does not have the permission required to use a specific component while composing an OBA.

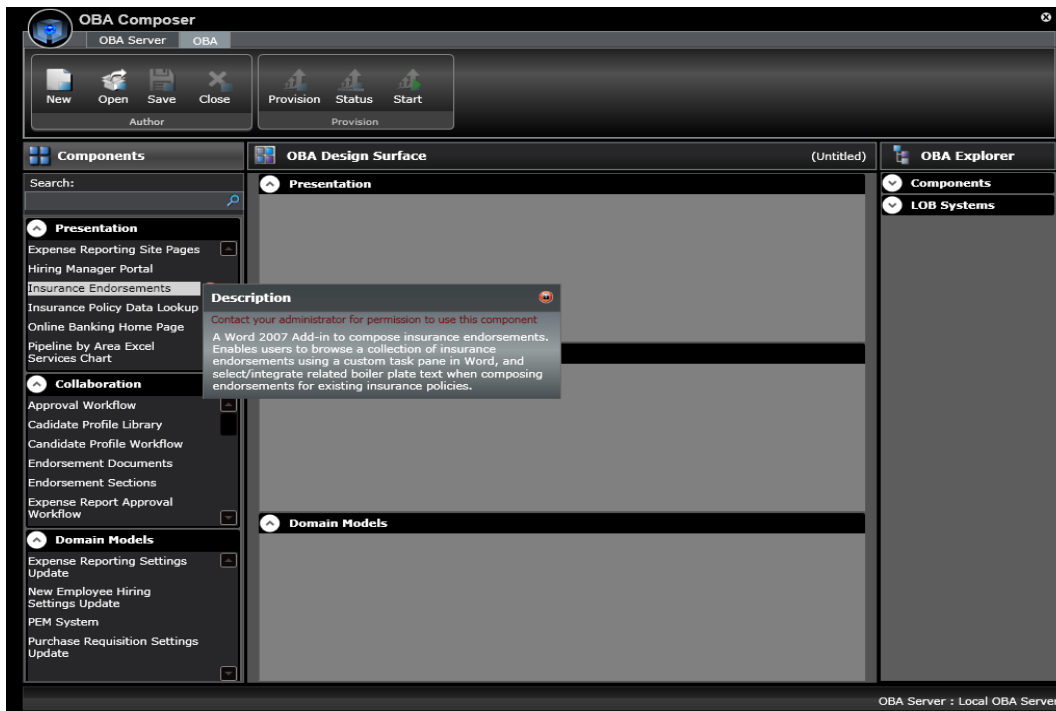


Figure 4: Prescriptively secure user experience

Search keywords can be used to filter the list of components to those that are related to a specific domain/need. Search strings specified by a user are matched against component names, descriptions, and associated search tags to filter the list of related components that are matches for specified criteria.

In the **Search** box, type **Drug Research**, and then click the magnifying glass icon to execute a search to filter down the list of components in Component Explorer.

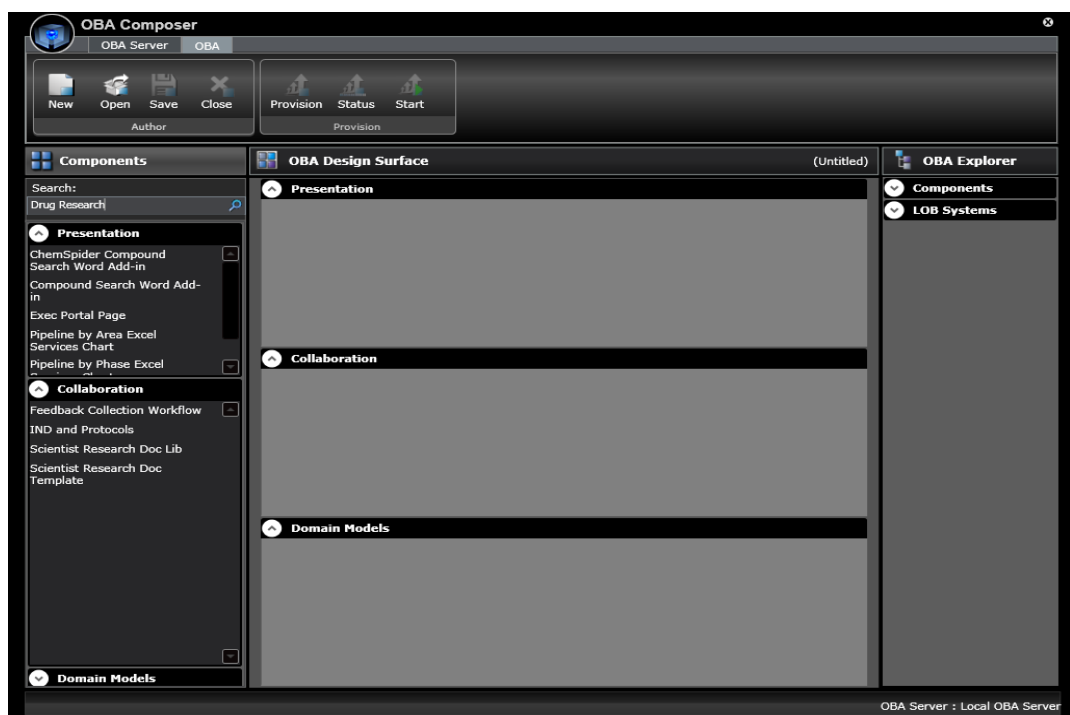


Figure 5: Drug Research components

Composing an OBA

You will now start composing the Drug Research OBA.

You will first select and add a document template component to facilitate the creation of drug research analysis documents. Click the Scientist Research Doc Template component in the Collaboration panel of Components Explorer to add it to the design surface. The component will get added to the **Collaboration** section on the OBA Design Surface, as shown in Figure 6.

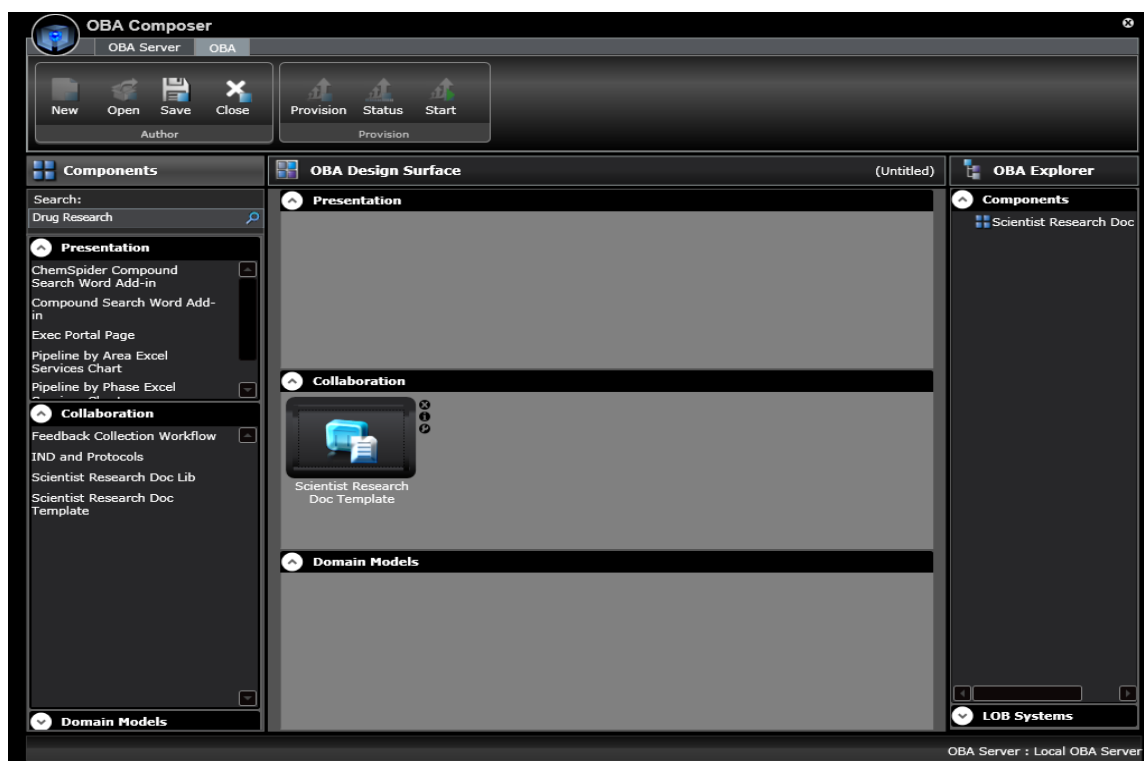


Figure 6: Scientist Research Doc Template component added to the OBA Design Surface

Next, click the component added to the OBA Design Surface to view a list of other components that are related to it and that can be associated to it, as shown in Figure 7. This action illustrates the traversal of component relationships metadata to locate other components that can be used in conjunction with to a selected component and will add value to it. For information about the concepts of Related and Associated component relationships, see the [Fundamental Concepts](#) section earlier in this guide.

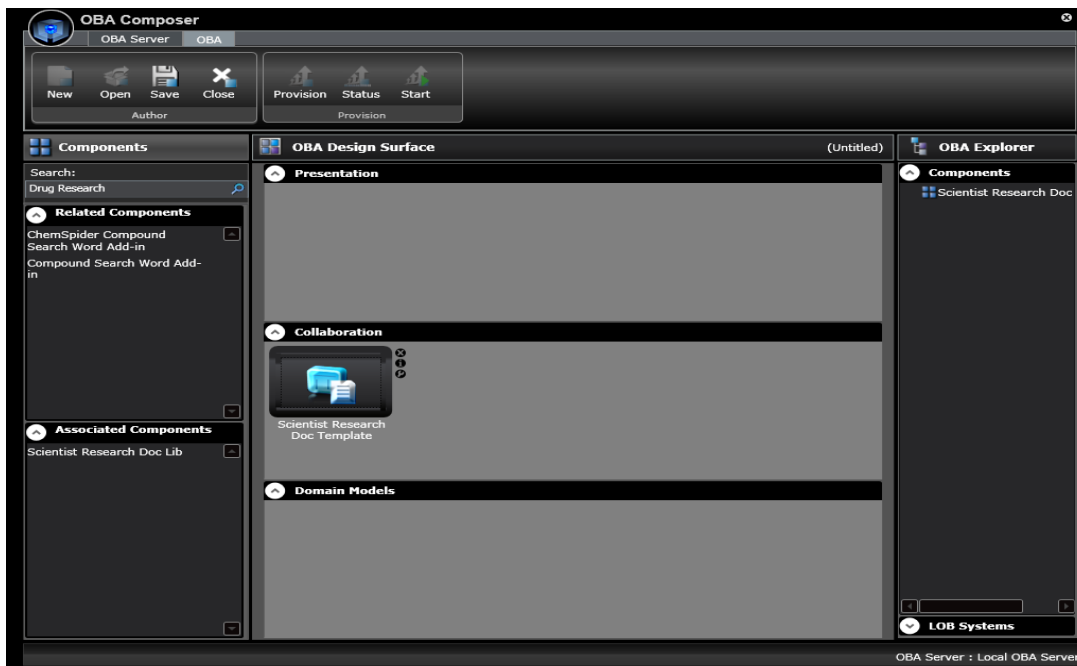


Figure 7: Related and Associated components for the Scientist Research Doc Template

Add the **Scientist Research Doc Lib** associated component. This component is a SharePoint document library for storing scientist research documents. This action will result in the research document template being associated as a content type with the document library.

Select the document library component on the OBA Design Surface. The list of components in Components Explorer will be refreshed to list the components that are related and/or associated to it. Select and add the Approval and Feedback Collection workflow components from the list of Associated components. These actions will result in the workflow components being added to the OBA Design Surface and association relationships being established between them and the document library. When deployed, these associations will be materialized as SharePoint workflow associations for the research documents SharePoint document library.

You have now completed iteration 1 of composing the Drug Research OBA and are ready to deploy/provision and run the OBA. Figure 8 illustrates components added to the OBA Design Surface in iteration 1.

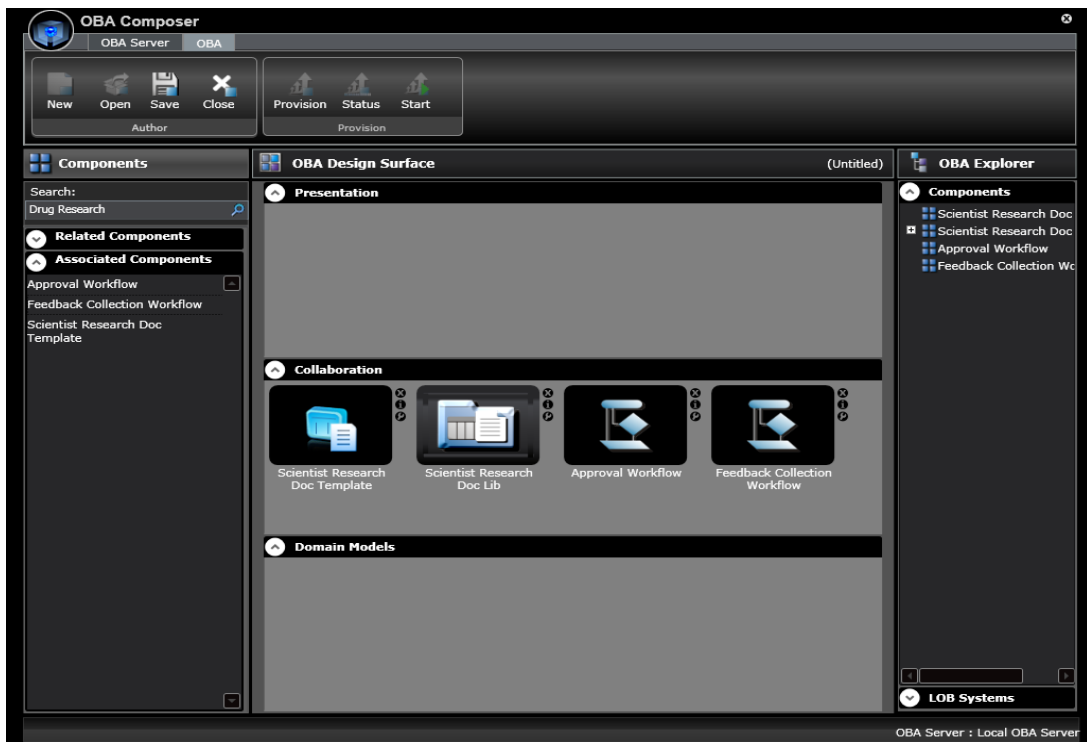


Figure 8: Iteration 1 of the Drug Research OBA composition

Saving an OBA

On the OBA ribbon, click the **Save** button to launch the **Save OBA** dialog box.

Specify a name and description for the OBA on the **General** tabbed page, as shown in Figure 9.

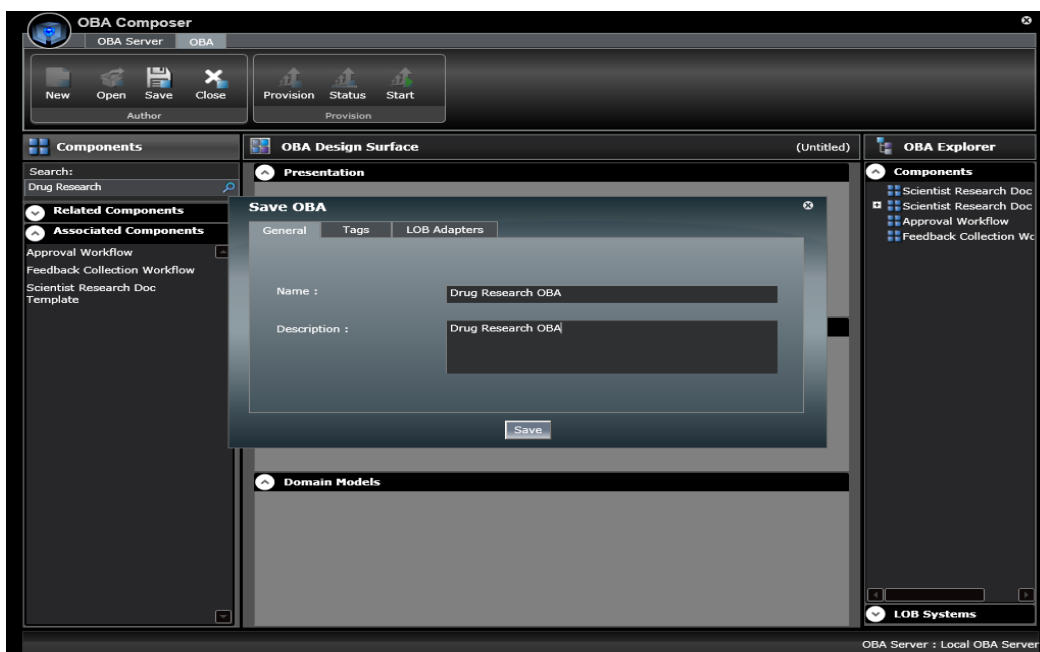


Figure 9: Save OBA dialog box

In the **Save OBA** dialog box, click the **Tags** tab and execute a search on the keyword **HLS** to locate and associate the Health & Life Sciences industry tag with the OBA definition, as shown in Figure 10.

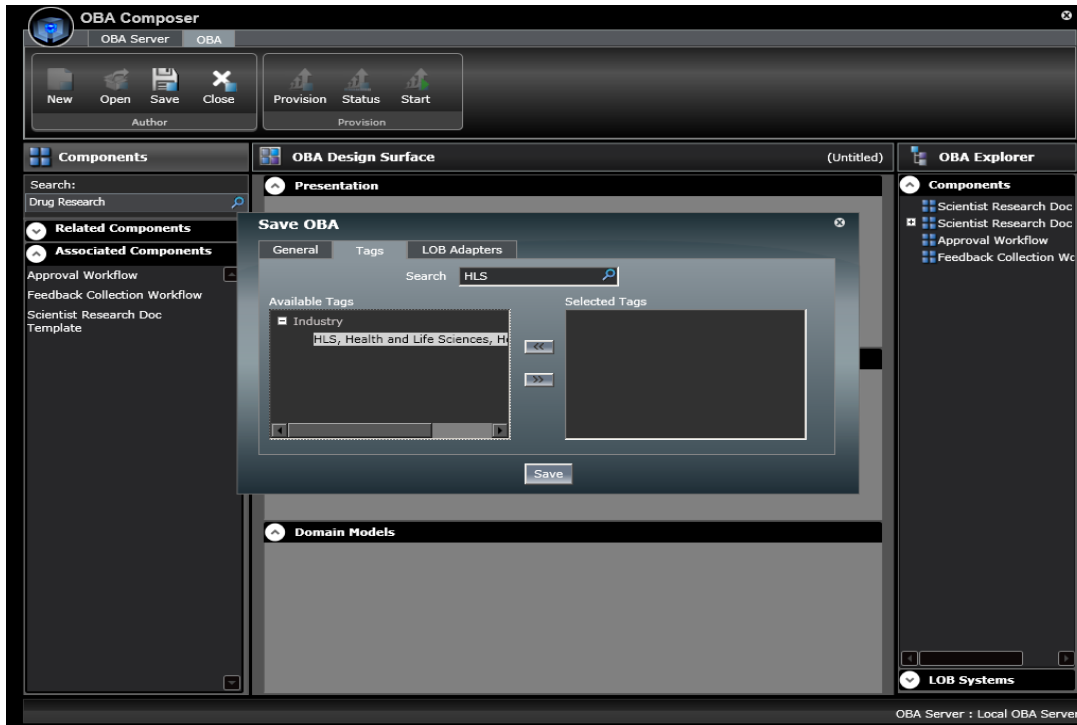


Figure 10: Associating Search Tags with an OBA

The component selections in iteration 1 did not result in any LOB adapters being referenced because the selected components do not access any LOB data or processes.

Click the **Save** button to save the OBA definition. When saved, the OBA definition is persisted to the OBA Composition Server's repository.

Provisioning an OBA

Provisioning an OBA is the process of deploying an OBA definition to the user's sandbox OBA run-time environment in a SharePoint farm. A user's sandbox OBA run-time environment is a SharePoint site to which all OBAs composed by the user are deployed.

On the OBA ribbon, click the **Provision** button to submit a provisioning job to the OBA Composition Server. Click **OK** to dismiss the dialog box that displays to notify you that a job has been submitted to the server to provision the OBA.

On the OBA ribbon, click the **Status** button to monitor the status of the submitted provisioning job. The provisioning status dialog box will list the various steps that must be executed successfully to provision the OBA (see Figure 11).

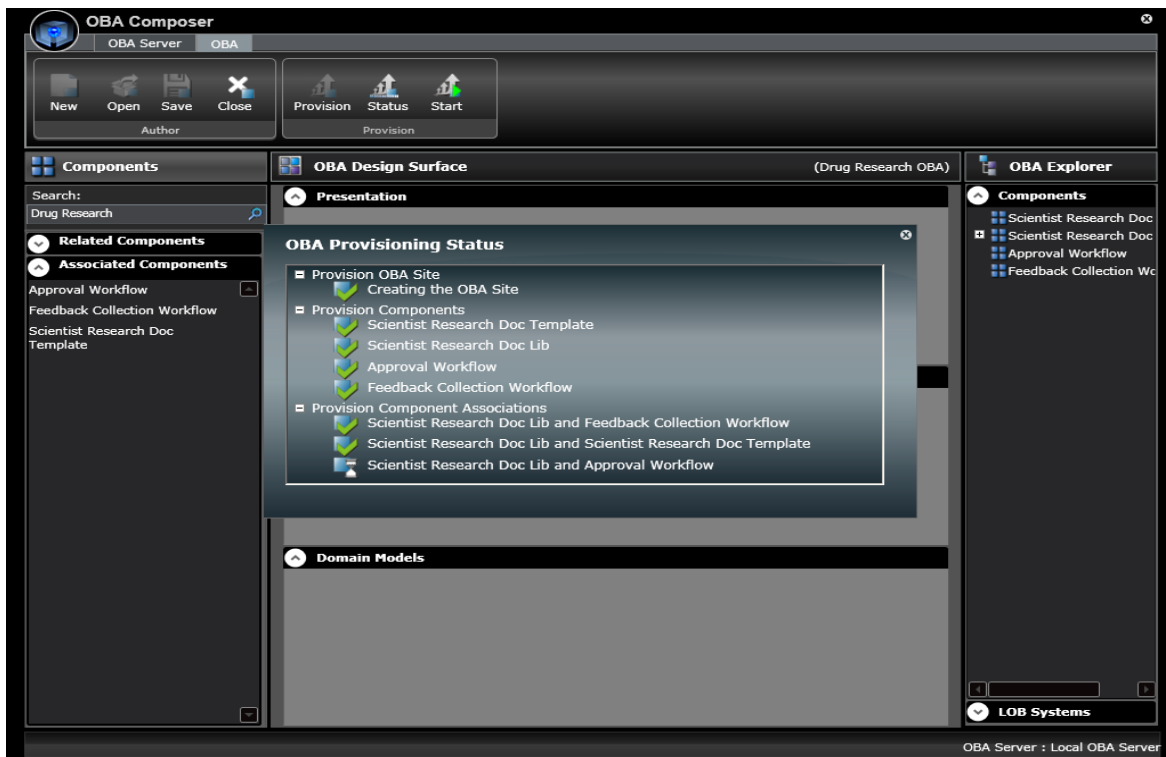


Figure 11: The OBA Provisioning Status dialog box

Wait until all the provisioning steps complete successfully (indicated by a green check mark displayed by the side of a provisioning step) and close the status dialog box.

The phase 1 iteration of composing and deploying the Drug Research OBA is now complete, and the OBA has been deployed and is ready to be run.

Running a Provisioned OBA

On the OBA ribbon, click the **Start** button to run the provisioned OBA. This action will result in the SharePoint site for the OBA being opened in an instance of Internet Explorer.

The site navigation pane on the left will display a link to the Scientist Research Doc Lib. Click this link to navigate to the SharePoint document library generated for the document library component added to the OBA definition.

To see the content type association generated for the Scientist Drug Research Analysis document template, click the **New** menu. Figure 12 illustrates the content type association generated for the SharePoint document library.

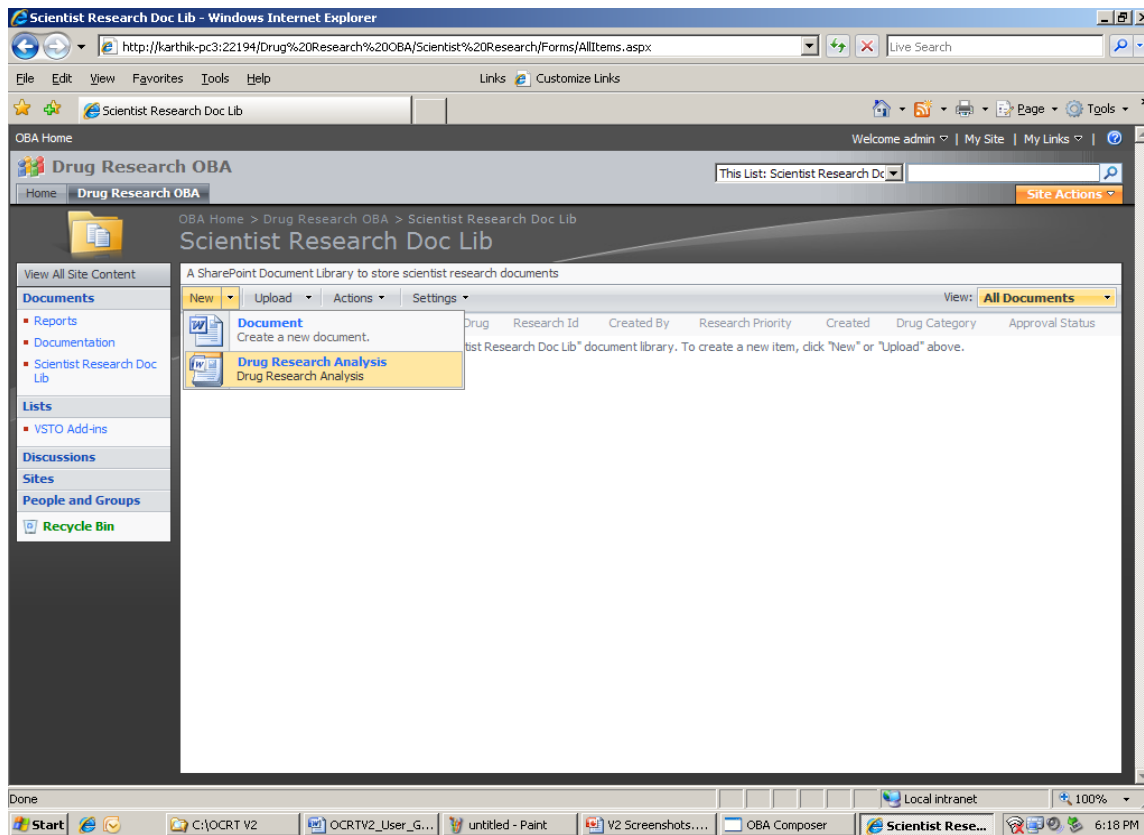


Figure 12: Document library content type association for the Drug Research Analysis document template

Navigate to the Document Library's Workflow settings (to do this, click **Settings**, point to **Document Library Settings**, and then click **Workflow Settings** in the document library settings page) to see the associations generated for the two workflow components selected when composing the OBA, as shown in Figure 13.

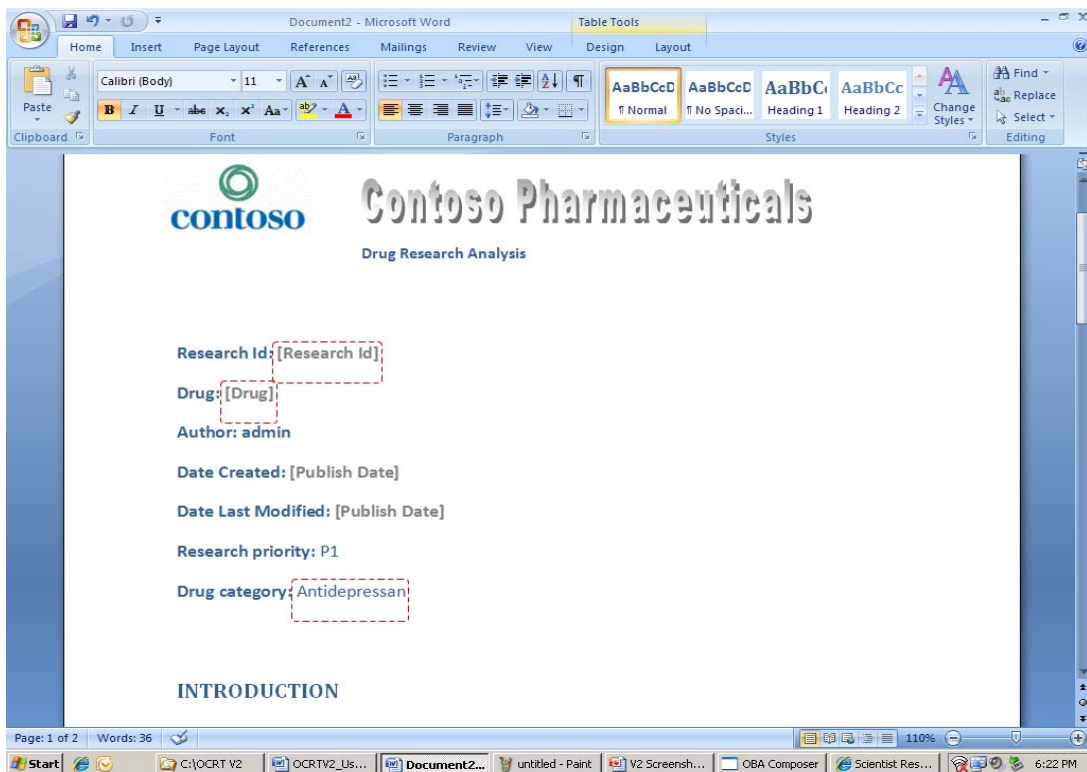


Figure 14: Drug Research Analysis document template

One of the activities performed while documenting drug research analysis is locating and integrating information about chemical compounds used in the analysis.

You will now extend the iteration 1 OBA definition to integrate additional components that will enable scientists to locate and integrate information about chemical compounds using internal and external compound search/lookup services.

Extending/Modifying an OBA

Close Internet Explorer and return to the OBA Composer application where the definition of the Drug Research OBA is open and active.

In the Collaboration section of the OBA Design Surface, click the **Scientist Research Doc Lib** component to view components that are related to it and which can be associated to it.

You will see two Word add-in components in the list of related components. These components enable searching/looking up compound information using an external service (www.chemspider.com) and from a local drug database. Select and add both these components to the OBA definition. You will notice that they get added to the Presentation layer of the OBA Design Surface, as illustrated in Figure 15.

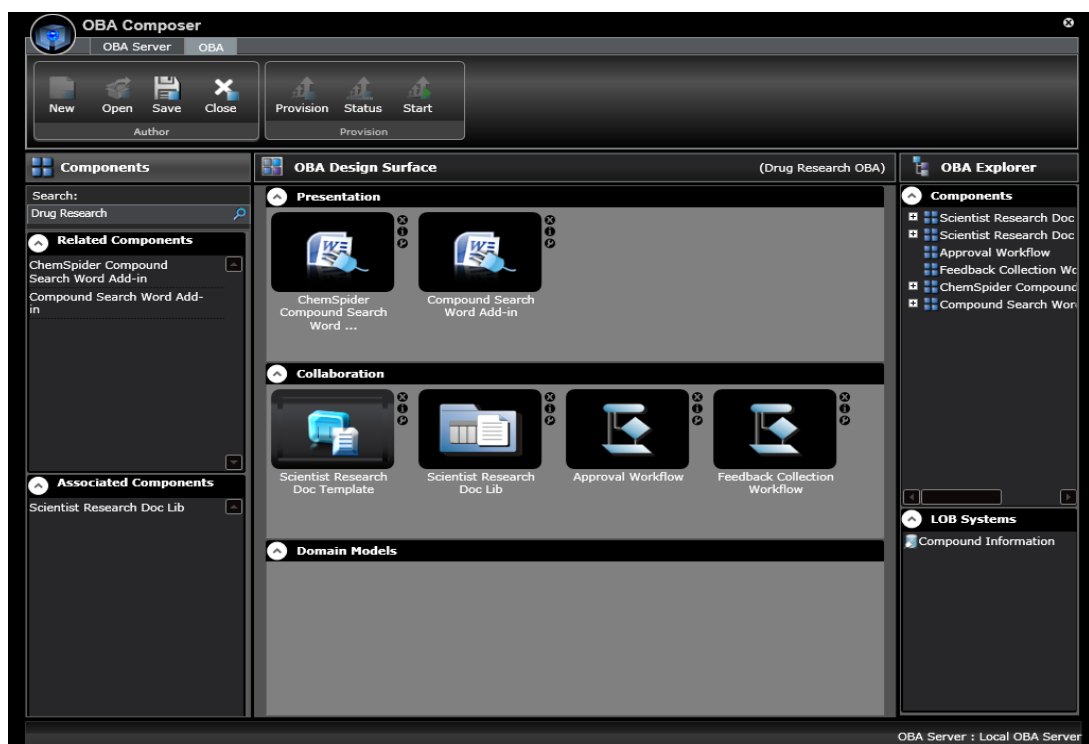


Figure 15: Compound lookup Word Add-in components added to the OBA definition

You will also note that adding these components results in the addition of the **Compound Information** Web service adapter to the LOB Systems list in OBA Explorer. This adapter is used to wire up to Web services that will enable searching/looking up compound information from the specified sources of compound information.

This completes iteration 2 of composing the Drug Research OBA. Save the OBA Definition to persist the changes to the OBA Composition Server repository.

Provisioning an Extended/Modified OBA

Provision the OBA and monitor the provisioning status to verify the successful incremental deployment of the two newly added components. Figure 16 shows the OBA Provisioning Status screen that displays the provisioning status of the 2 incrementally deployed components.

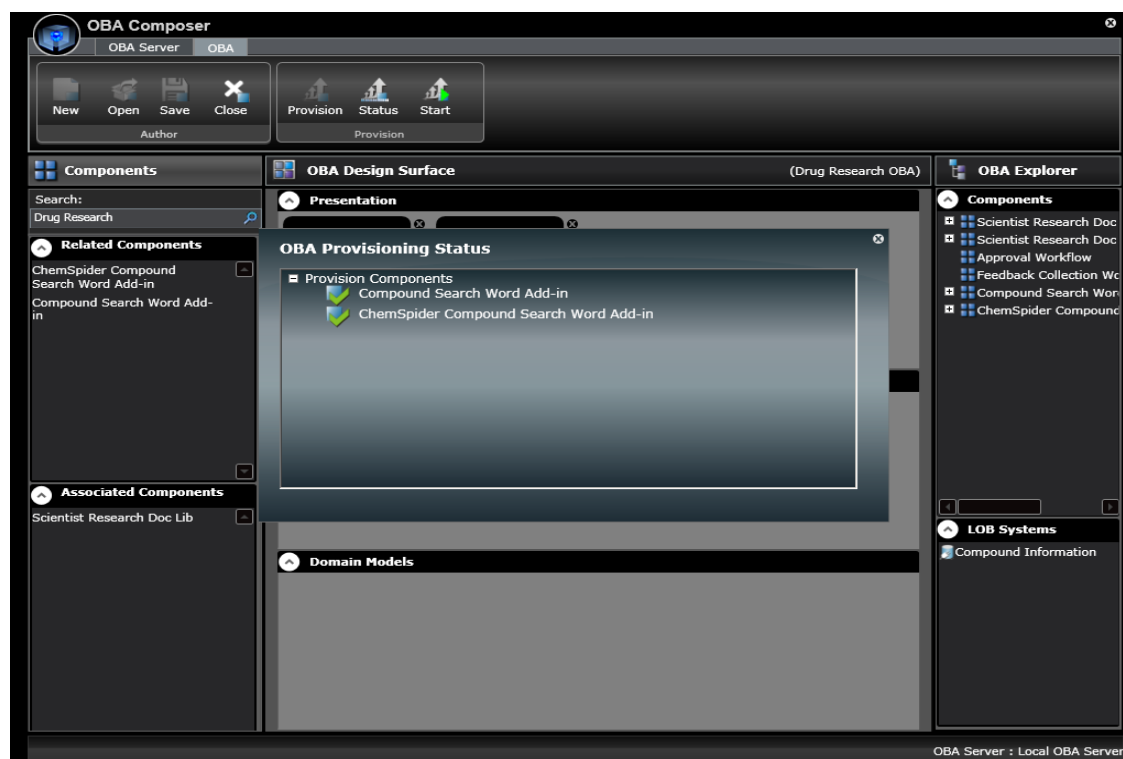


Figure 16: Provisioning the compound search/lookup Microsoft Word Add-ins

Start the OBA to launch its SharePoint site.

In the left pane, click **VSTO Add-ins**. The VSTO Add-ins list in an OBA site is used to store links to ClickOnce installer packages for VSTO Office application add-in components added to an OBA definition. You will see items generated in this list to invoke the installers for the two add-in components that you added to the OBA definition. Click these links one at a time to install the add-ins. Installing the add-ins will create registry entries on your local machine that will be used by Microsoft Word to invoke the add-ins (from the SharePoint/OBA Composition Server) on startup and integrate the user interfaces implemented in the add-in into its UI shell.

Note: Close all active instances of Word (including the instance you have open to read this document) and reopen an instance to continue reading this document. This is required for Word to load up the add-ins that you just installed.

Navigate to the Scientist Research Documents library in the OBA site and open a new instance of the Drug Research Analysis document template.

You will notice that a new Compound Lookup ribbon has been integrated into the list of ribbons in the Microsoft Word UI shell. When you navigate to this ribbon, you will see ribbon groups that expose actions to invoke services to look up compound information using the ChemSpider Web services and from the local drug database. (Note: Only the search actions have been implemented in the sample component.)

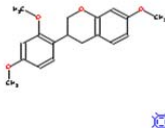
In the ChemSpider Services ribbon group, click the **Search** button to open a custom task pane (a UI component in the add-in) that you can use to search for compound information using the ChemSpider search service. (Note: You need an active Internet connection to use the ChemSpider Services Search service.)

In the task pane, type a chemical compound name (such as Methyl, methoxy-chromane, or benzene) in the **Search for** text box, and then execute a search to retrieve a list of matching compounds. Click any of the retrieved compound names to display additional information about the compound.

Position the cursor at a location in the document where you want to insert information about the compound, and then click **Add to Document** button in the task pane to insert the compound information into the document surface at the cursor location. Figure 17 shows the compound information inserted into the word document instance.

The screenshot shows a Microsoft Word document titled 'Document1 - Microsoft Word' with the 'Table Tools' ribbon active. The 'Compound Lookup' group contains buttons for 'Search', 'MassSpec', 'InChI', 'OpenBabel', 'Local Drug Database', and 'ChemSpider Services'. The 'ChemSpider Services Search' task pane is open on the right, displaying search results for 'methoxy-chromane'. The first result, '3-(2,4-dimethoxyphenyl)-7-methoxy-chroman', is selected. The main document area displays the following information:

CONSTITUENT COMPOUNDS
3-(2,4-dimethoxyphenyl)-7-methoxy-chroman

Formula	C18H20O4
SMILES	<chem>O(c1ccc(c(OC)c1)C2Cc3c(OC2)cc(OC)cc3)C</chem>
Avg. Mass	300.349 gm mol-1
Structure	http://www.chemspider.com/ 

ISOLATION

The task pane on the right includes an 'Add to Document' button and a 'Preview' section showing the compound's name, formula, SMILES, and average mass, along with a small chemical structure image.

Figure 17: Using the ChemSpider Compound Search service in Microsoft Word

Specify values/entries for the required metadata properties at the top of the document (such as research ID or drug name) and save the document instance to the SharePoint Document Library.

Close the drug research analysis document instance and return to the OBA Composer.

Closing an OBA definition

You have completed iteration 2 of composing the Drug Research OBA, so you can now close the OBA definition. To do this, click the **Close** button on the OBA ribbon.

Reopening a Saved OBA Definition

A saved (and closed) OBA definition can be reopened and extended. You will now re-open the saved Drug Research OBA definition and extend its definition to integrate a few more additional components.

In the OBA ribbon group, click the **Open** button to display the **Open OBA** dialog box. In the list of available OBAs, click **Drug Research OBA**, and then click **Open** to open and display its definition on the OBA Design Surface. Figure 18 illustrates this dialog box.

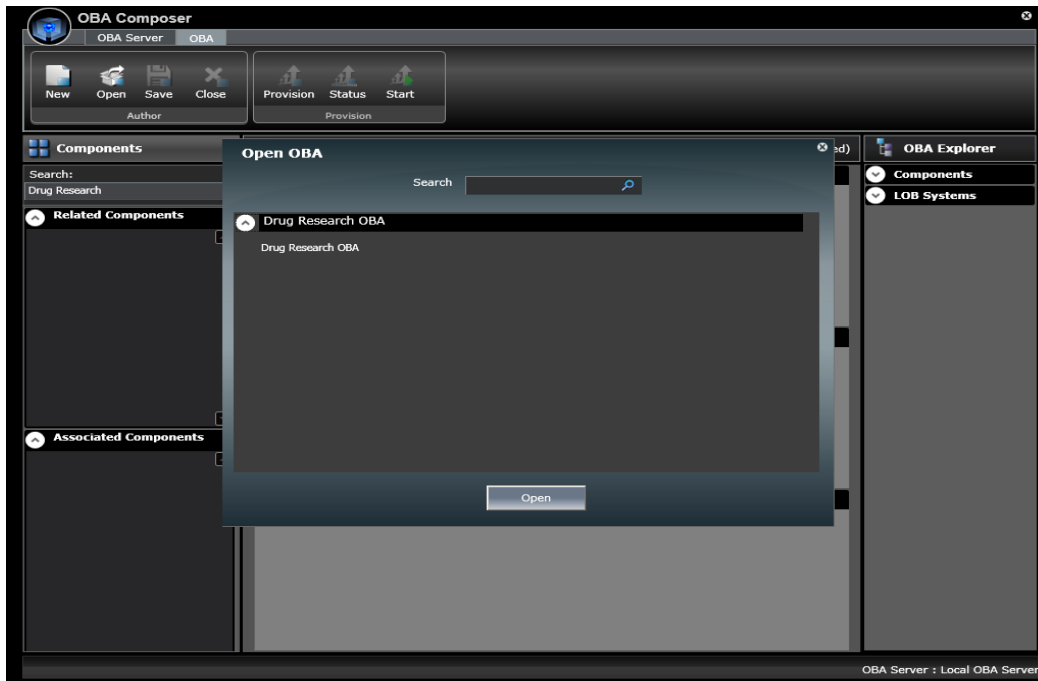


Figure 18: The Open OBA dialog box

In Components Explorer, type **Drug Research**, and then execute a search to retrieve matching components.

Select the Exec Portal Page component from the list of retrieved components to add it to the OBA Design Surface. You will notice that adding this component also pulls in the real-time KPI list component. This illustrates the notion of a supporting relationship between two components. The KPI list component is marked in the components metadata as a component that supports the Exec portal page component. As a result, adding the Exec portal page components results in the KPI list component also being added automatically to the OBA Design Surface.

Next, click the Exec Portal Page component on the OBA Design Surface to view a list of its related components. You will see two related Excel Services Chart components. Select these components to add them to the OBA definition.

Save and provision the OBA definition and monitor the provisioning status to verify the successful incremental deployment of the newly added components.

Start the OBA. You should see the Exec Portal Page open in an instance of Internet Explorer. Notice that the portal page has the KPI list Web Part and Excel Services Web Part instances to render the two chart components selected while extending the OBA definition. Figure 19 illustrates the SharePoint Executive Portal.

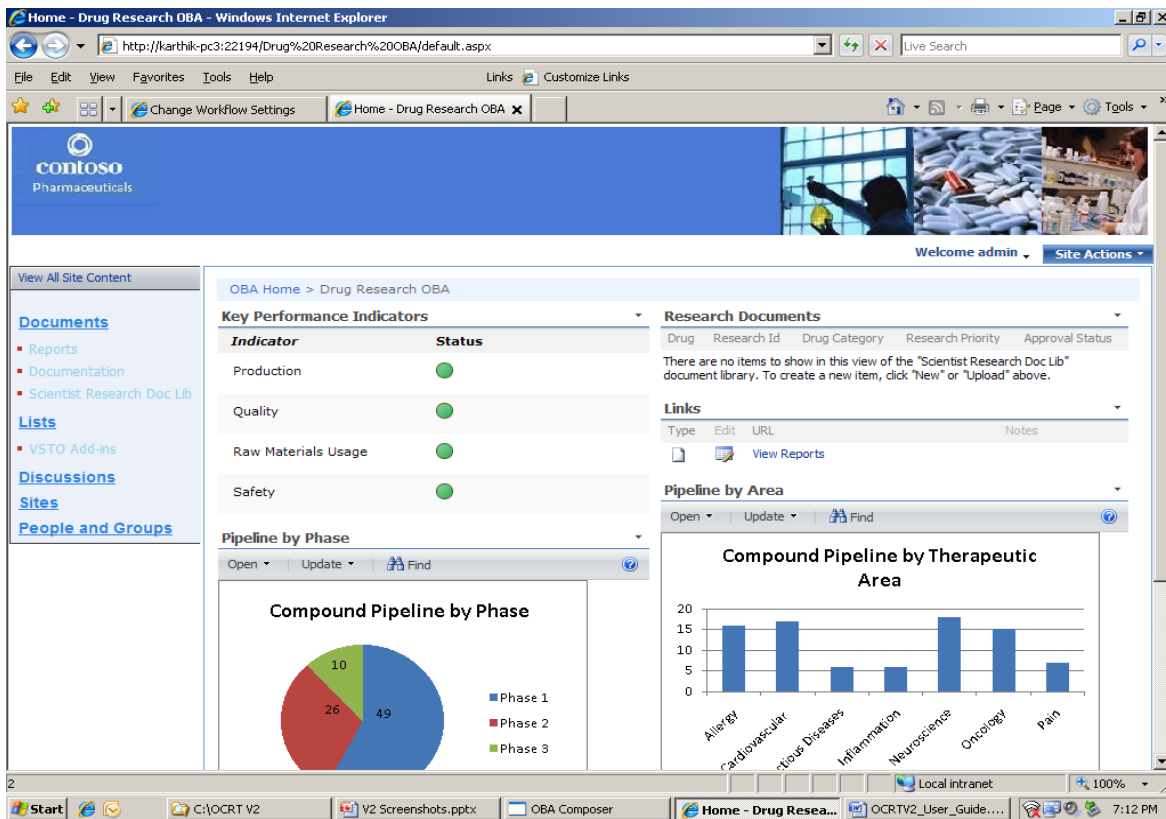


Figure 19: The Exec Portal Page of the Drug Research OBA

Close Internet Explorer and the OBA Composer application.

Deleting/Removing an OBA

OBAs composed and deployed using the OBA Composition Reference Toolkit can be uninstalled using the Uninstall OBA utility application. This application can be invoked from the OBA Composition Reference Toolkit program group.

The application is a simple Windows Forms application that displays a list of OBA definitions in the OBA Composition Server repository. You can select the OBA that you want to remove and delete its definition. If you select the **Delete definition** check box, the SharePoint site generated for the OBA is deleted and the OBA definition is removed from the OBA Composition Server's repository. If the Delete definitions check box is not selected, only the OBA site is deleted; the metadata definition of the OBA is not removed from the OBA Composition Server repository (the definition can be reused to re-provision the OBA when required). Figure 20 illustrates the **Uninstall OBA** dialog box.

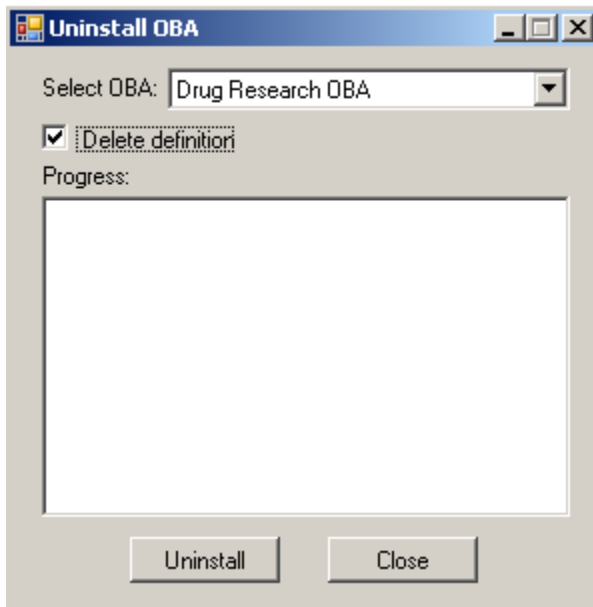


Figure 20: The Uninstall OBA utility

Exploring Other Sample Components

Version 2 of the OBA Composition Reference Toolkit includes a number of seed components that can be used to compose a variety of OBAs. The following is a list of OBAs that can be composed using combination of sample components included with the toolkit:

- A Purchase Requisitions Management OBA (Components search keyword: Purchase Requisition)
- An Expense reporting OBA (Component search keyword: Expense Reporting)
- An O&G Plant Floor Manufacturing OBA (Component search keyword: Plant Floor)
- An Insurance Endorsements management/collaboration OBA (Component search keyword: Insurance)
- A financial services online banking OBA (Component search keyword: Banking)

This document has introduced you to the core concepts that you need to be aware of to compose and deploy OBAs using the tools and services included in the OBA Composition Reference Toolkit. You can now apply the skills developed to compose and explore the other OBAs using the seed components included in the toolkit.
