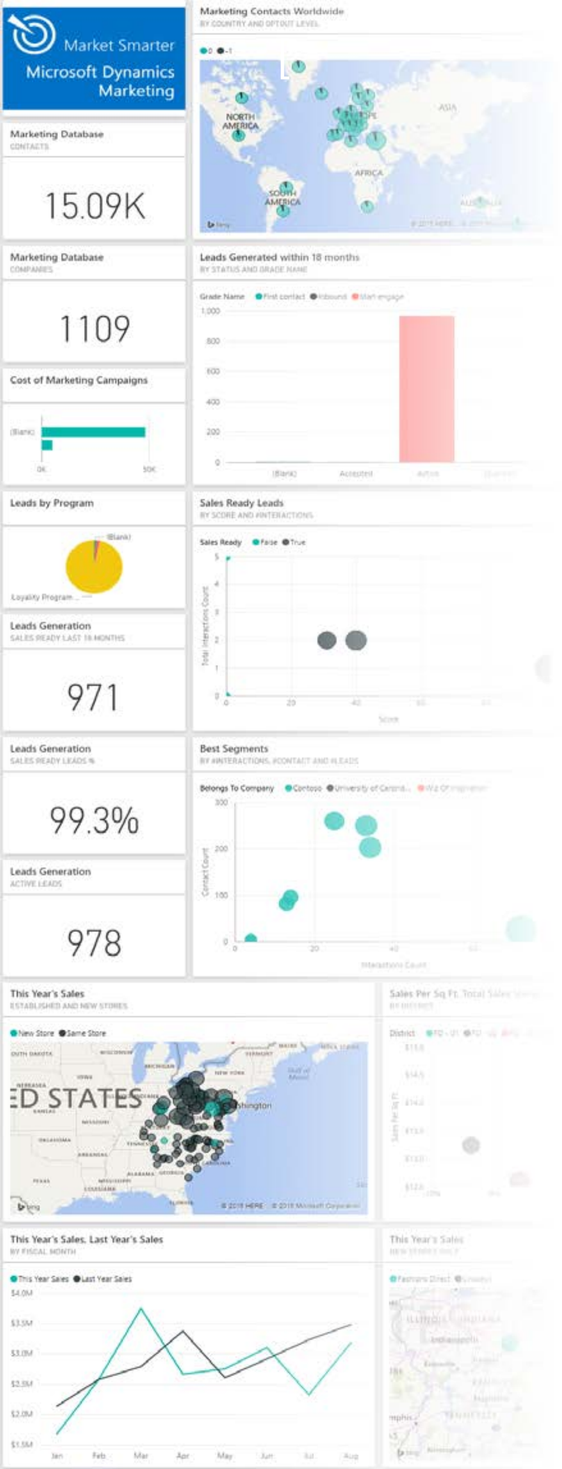
Create custom analytics in Dynamics 365 with Power BI

Gain insights that can help turn your sales and marketing numbers into data-driven success stories

Microsoft



The power of analytics

Data analytics is one of the most important tools for operating an effective, modern, and data-driven business. It enables managers and decision-makers to extract, visualize, and share actionable *business intelligence* from a vast ocean of sales and marketing data.

Dynamics 365 (online) and Dynamics Marketing provide built-in reports and analytical tools. But every business is different – and your organization's analytics requirements are unique – so you may soon find that you need additional customized views of your data.

That's where Microsoft Power BI comes in. Use it to combine multiple data sources and design your own data visualizations, creating real-time, interactive reports and dashboards tailored for your specific business needs.

Once you have finished reading this eBook, you will be able to:

- Enable Power BI for Dynamics Marketing and/or Dynamics 365 (online)
- Connect Power BI to your Dynamics Marketing and/or Dynamics 365 (online) instance
- Run the Power BI online portal and desktop app
- Create and publish data visualizations
- Set up a Power BI widget in Dynamics 365

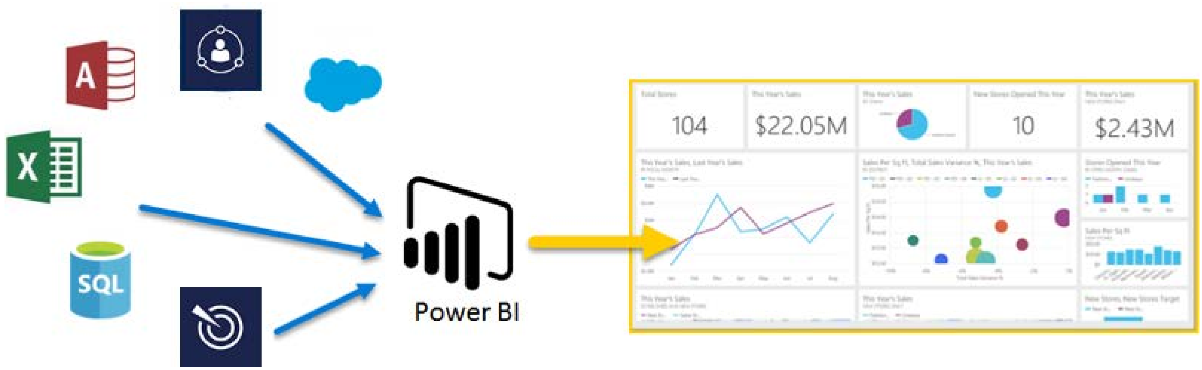
Connect with OData

Power BI uses a technology called the Open Data Protocol (OData) to connect to one or more data sources, including Dynamics 365 and Dynamics Marketing.

To connect to an OData feed, all you need is the right URL and valid authentication credentials (such as your Office 365 sign-in).

Power BI takes advantage of federated authentication, which means that once you are signed in to Office 365, you are also signed in to Dynamics Marketing, Dynamics 365, and the Power BI portal.

Security roles still apply, so users can only see data in Power BI that they also have permission to view in the Dynamics apps.

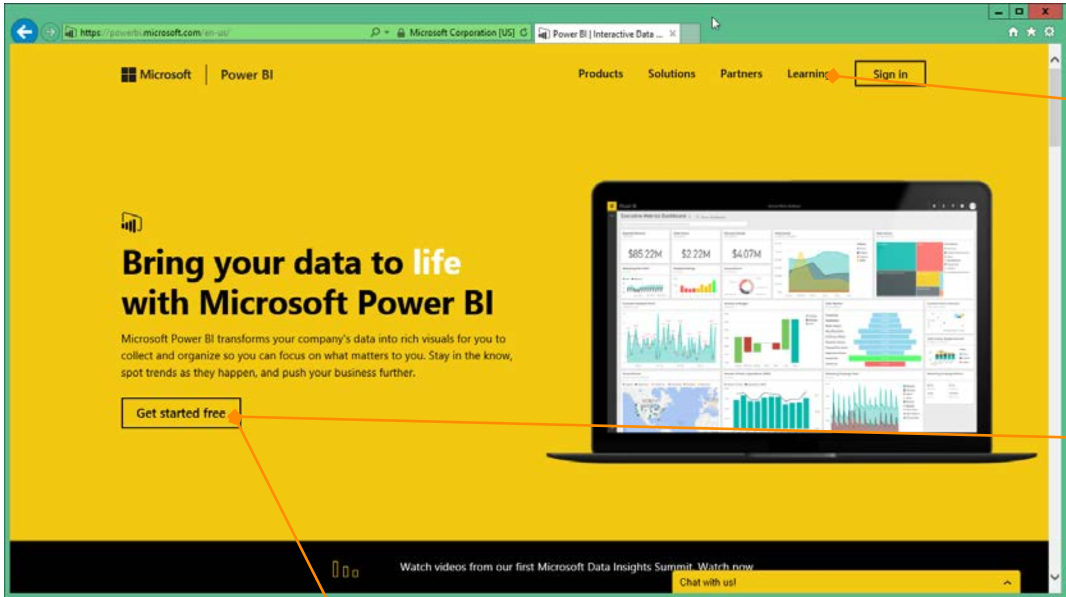


Get ready for Power BI

Get started by signing up for Power BI online and downloading the desktop app

Assemble your Power BI toolbox

Everything you need to get started with Power BI is just a few clicks away. If you have never used Power BI before, start by going to powerbi.microsoft.com, and then:



1. **Run the first module of the online course**
   The Learning area of the website includes an excellent course featuring both video and text. If you are new to Power BI, consider running the Getting Started learning module before continuing with this eBook.

2. **Download the Power BI desktop app**
   This is a free, advanced, and locally running environment for developing custom Power BI solutions and publishing them to the Power BI portal.

3. **Sign up for a free Power BI trial**
   If you don't already have a Power BI license, this will give you access to the Power BI portal and pre-built content packs for Dynamics 365 and Dynamics Marketing. (The free trial is fully functional, but does not allow you to share or embed your reports or dashboards.)

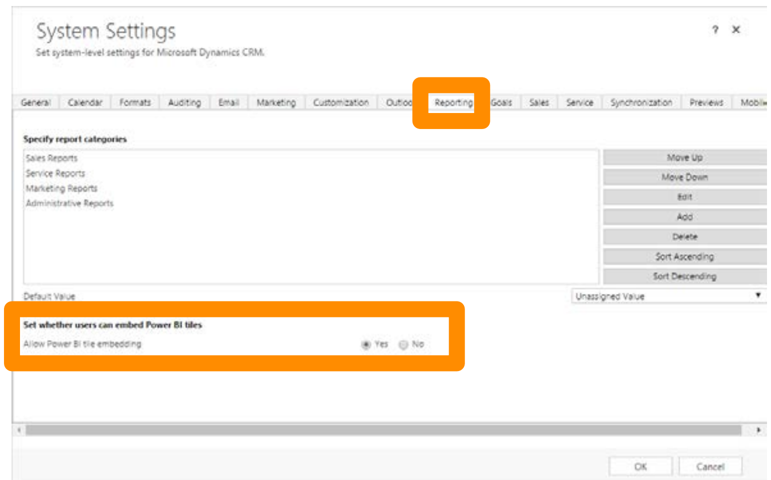
Enable Power BI in Dynamics Marketing and Dynamics 365

Dynamics 365 (online)

To use all the Power BI features with Dynamics 365, as described in this eBook, you must:

- Be using Microsoft Dynamics CRM Online 2016 Update 1 (or later).
- Enable Power BI tiles for your instance. To do so, go to **Settings > Administration > System Settings**. Then open the **Reporting** tab and set **Allow Power BI tile embedding** to **Yes**.

If you are an administrator, see the following online help topic for details: Use Power BI with Microsoft Dynamics 365.

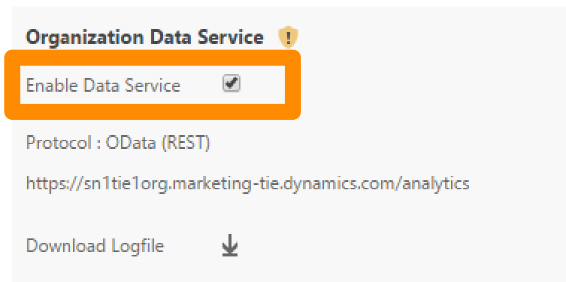


Dynamics Marketing

To use Power BI with Dynamics Marketing, you must:

- Enable OData feeds by going to **Settings > Administration > Site Settings** and then scrolling down to the **Organization Data Service** section. Make sure the **Enable Data Service** checkbox is selected.
- Your user account must include the *OData - Organization Data Service* privilege and also have permissions to all feature areas that you want to access with Power BI.

If you are an administrator, see the following online help topics for details: Configure site settings and Work with user accounts and staff contacts.

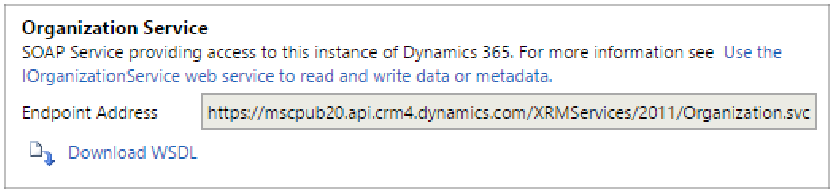


Find your OData feed URLs

Next, look up the URLs you'll need to connect to Dynamics 365 or Dynamics Marketing from Power BI. Take note of them, you'll need them later as you continue working through the exercises in this eBook.

Dynamics 365

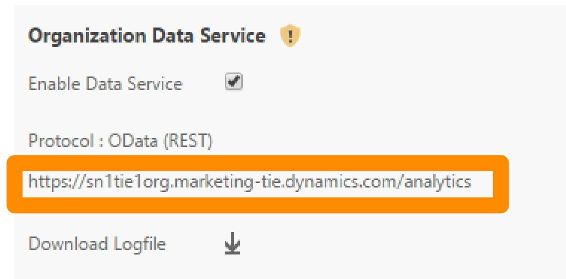
For Dynamics 365, you can find your OData endpoint URL by going to **Settings > Customizations > Developer Resources**. The URL is shown here under the **Organization Service** heading.



This is the full URL for the endpoint. Usually you'll need the full URL to connect to the service, but some solutions (such as premade content packs for Power BI), may ask only for the domain name (the *.com part of the address), so you need to pay attention to what is being requested when you are setting up the connection.

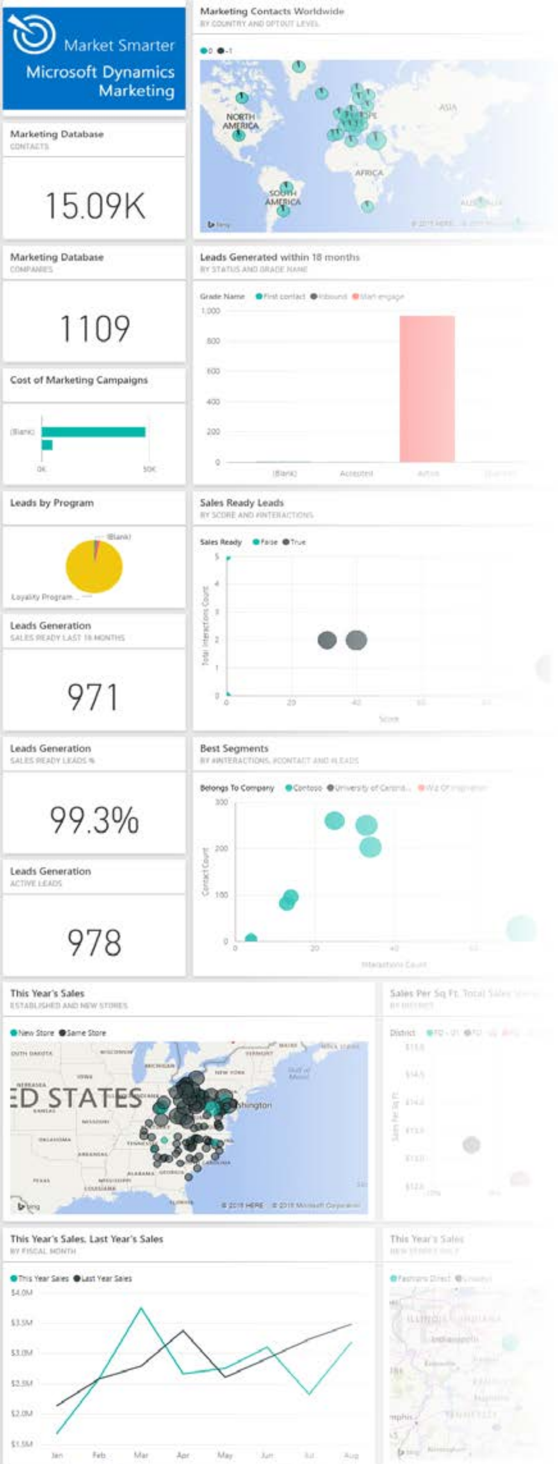
Dynamics Marketing

For Dynamics Marketing, find your OData endpoint URL by going to the **Site Settings** and then scrolling to the **Organization Data Service** section (as mentioned on the previous page). The URL shown here is your OData endpoint.



Your data in Power BI in five minutes or less

Get your first taste of Dynamics 365 with Power BI by loading a preconfigured dashboard and connecting it to your system



Power BI content packs

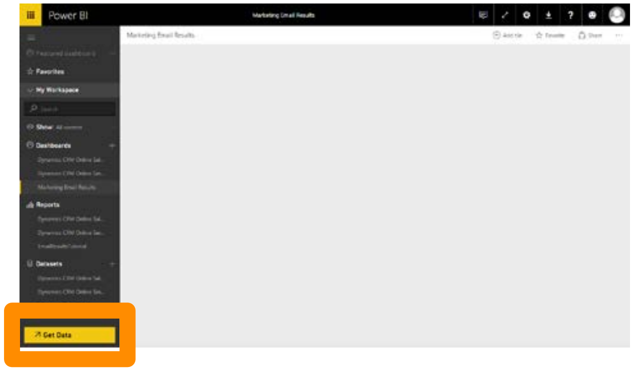
Content packs are preconfigured, application-specific reports and dashboards provided through the Power BI portal. All you have to do is sign in to Power BI, choose the pack you want to add and enter connection details for the Dynamics 365 or Dynamics Marketing instance you want to analyze.

Content packs are a great way to get started quickly with Power BI and to see how your own organization's data can be visualized using this technology.

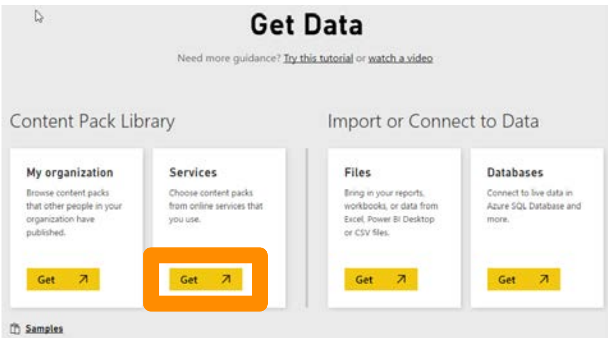
In this section, you'll learn how to choose a content pack, connect it to your Dynamics 365 or Dynamics Marketing instance, and use it to explore your data.

Add a content pack to your Power BI portal

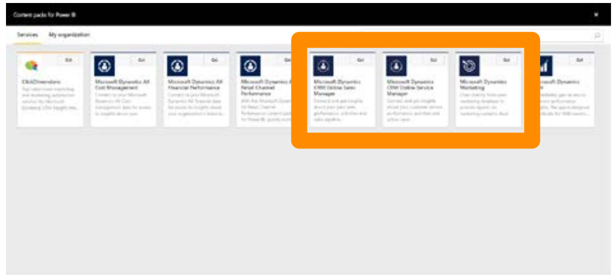
1. Sign in at powerbi.microsoft.com using the same Office 365 account that you use to access Dynamics 365 and/or Dynamics Marketing.
2. Click the **Get Data** button at the bottom of the left navigation pane. (If you're working with an empty Power BI portal, then you'll skip this step and go straight to the **Get Data** page.)



3. The **Get Data** page opens. In the **Services** box, click **Get**.



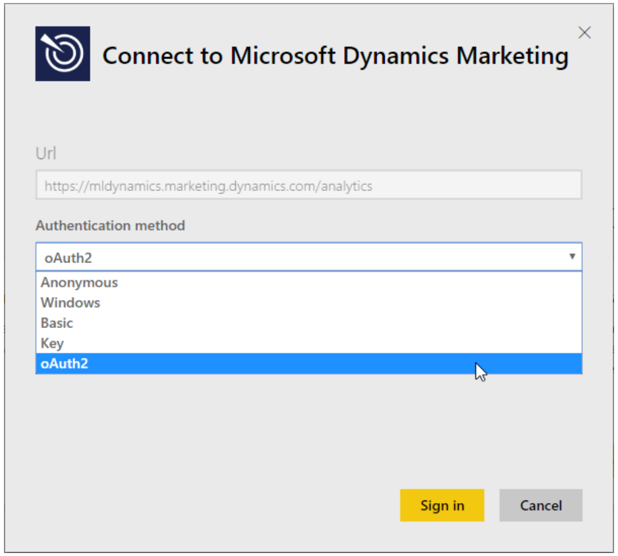
4. You now see a collection of available services. Type "Dynamics" in the search field to find all content packs that are available for the Dynamics family of products. Each content pack is named for the product it supports and the user role it is intended for. Click the **Get** button for the content pack that sounds most interesting to you.



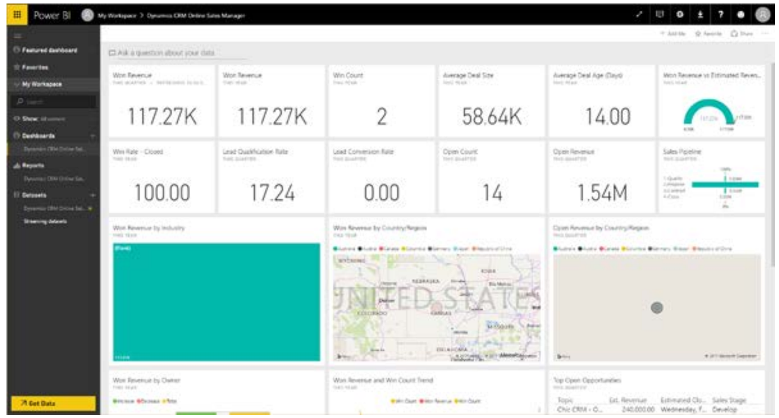
5. A **Connect** dialog opens, asking about your connection. Enter the URL you found in the previous section. As mentioned, the correct URL should resemble one of the following:
   - **Dynamics 365 (online)** content packs normally ask for the domain name only, such as: https://<*OrganizationName*>.crm.dynamics.com
   - **Dynamics Marketing** content packs normally require the full endpoint URL, such as: https://<*OrganizationName*>.marketing.dynamics.com /analytics
6. Enter any additional information requested by the **Connect** dialog (usually none) and then click **Next**.

Add a content pack to your Power BI portal

7. If you are asked to provide authentication credentials, set the **Authentication method** to **oAuth2** and click **Sign in**. Enter your user name and password in the form provided. (You might skip this step if you are already signed in with your browser.)



8. Power BI now creates the required datasets, reports, and dashboards for your selected content pack. It may take several minutes for the system to load all the data, but when it is done you should see your own, recognizable data displayed in the various panels of your new dashboard.



For more details and troubleshooting information about setting up a content pack for Dynamics Marketing or Dynamics 365, see:

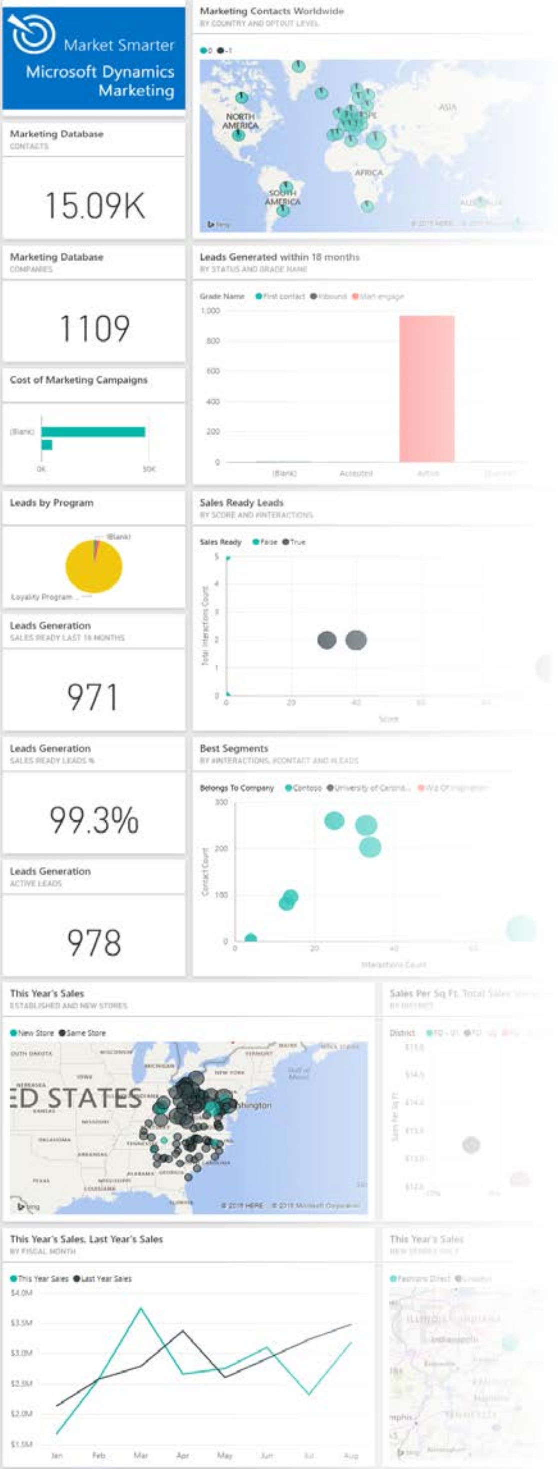
- Microsoft Dynamics Marketing content pack for Power BI
- Microsoft Dynamics 365 content pack for Power BI

For details about how to customize content packs for Dynamics 365, see:

- Customize Microsoft Dynamics 365 Power BI content packs

Tutorial: Embed marketing email KPIs in Dynamics 365

Many customers tell us they'd like to see email KPIs from Dynamics Marketing right in Dynamics 365. It's easy with Power BI!



Tutorial: Embed marketing email KPIs in Dynamics 365

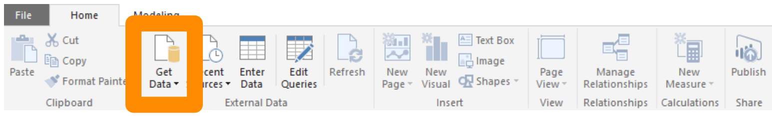
This tutorial walks you through all the steps needed to display email marketing results from Dynamics Marketing directly on a Dynamics 365 dashboard. During the tutorial you will:

- Connect to Dynamics Marketing from the Power BI desktop app
- Design visualizations for presenting email results
- Show geographical data on a map
- Interact with your data visualizations
- Publish reports designed in the desktop app to your Power BI portal
- Embed visualizations from your Power BI portal in a Dynamics 365 dashboard

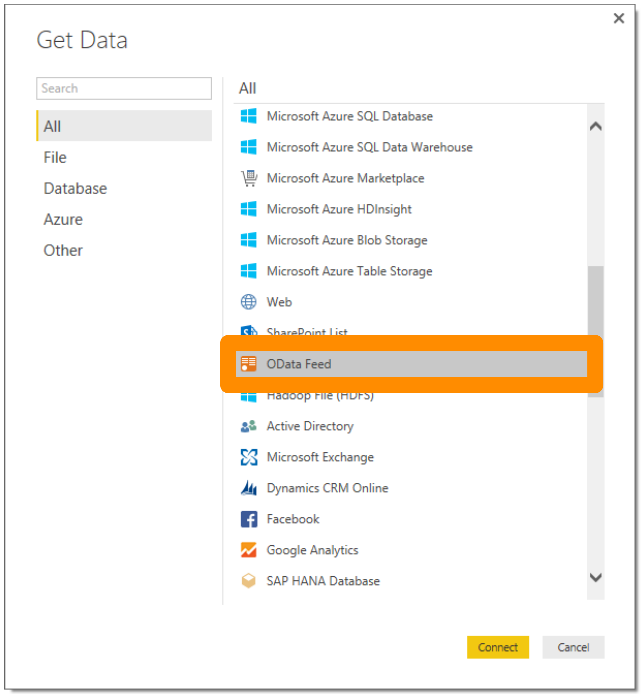
If you aren't using Dynamics Marketing, then try connecting to Dynamics 365 instead; or skip to part 5 and embed tiles from a Dynamics 365 content pack instead of visualizations from Marketing.

Part 1: Connect and load data

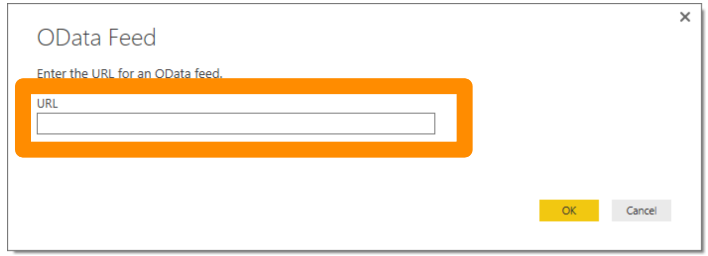
1. Launch the Power BI Desktop application.
2. From the ribbon's **Home** tab, click the **Get Data** button.



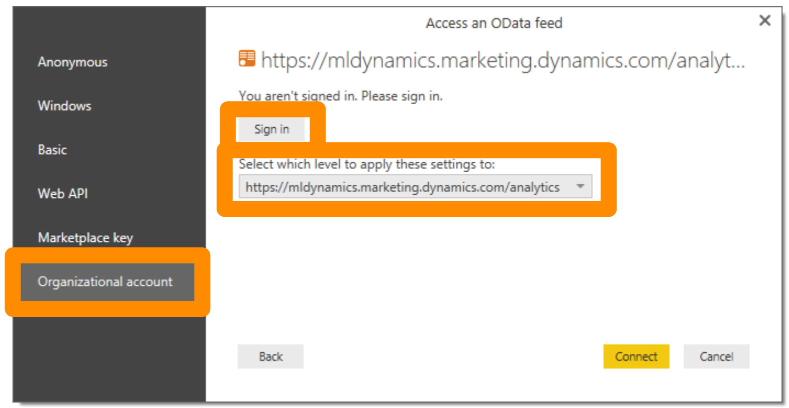
3. The **Get Data** window opens. Here you can choose from a variety of data sources, including Dynamics 365 (online). But Dynamics Marketing provides a standard OData feed, so choose **OData Feed** and click **Connect**.



4. The **OData Feed** window opens. Enter the **URL** you found for your Dynamics Marketing instance (as described [earlier in this eBook](#)).

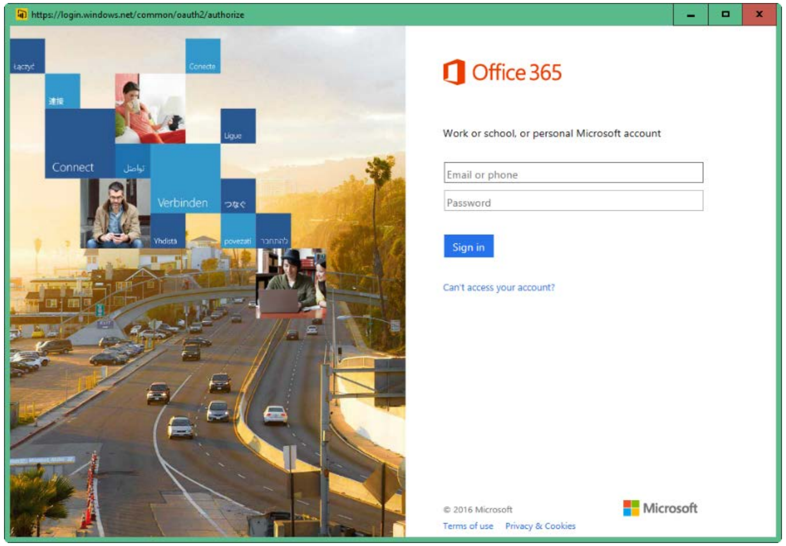


5. If you have never connected to this data source before (and you probably haven't), then you are now asked to sign in to Dynamics Marketing. Choose the **Organizational account** tab from the left column and, from the **Select which level to apply these settings to** drop-down list, choose the URL that ends with "/analytics." (The connection will fail if you leave this as the default, which doesn't include the full path.) Then click **Sign in**.

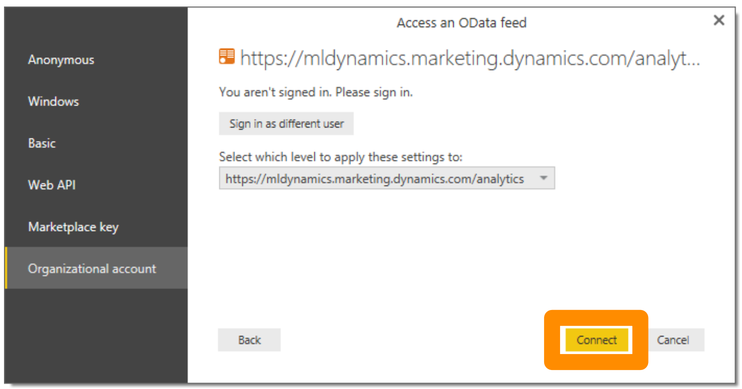


Part 1: Connect and load data

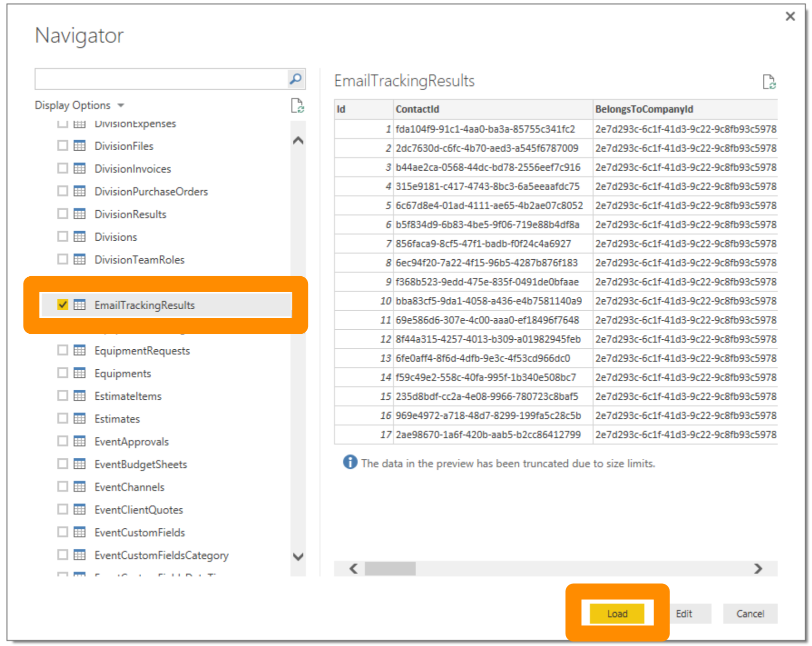
6. An Office 365 sign-in window opens. Use it to sign in using the Office 365 account that you normally use to sign in to Dynamics Marketing.



7. You now return to the Power BI desktop app. The button that used to say **Sign in** should now say **Sign in as a different user**, which means that you are now signed in. Click **Connect**.

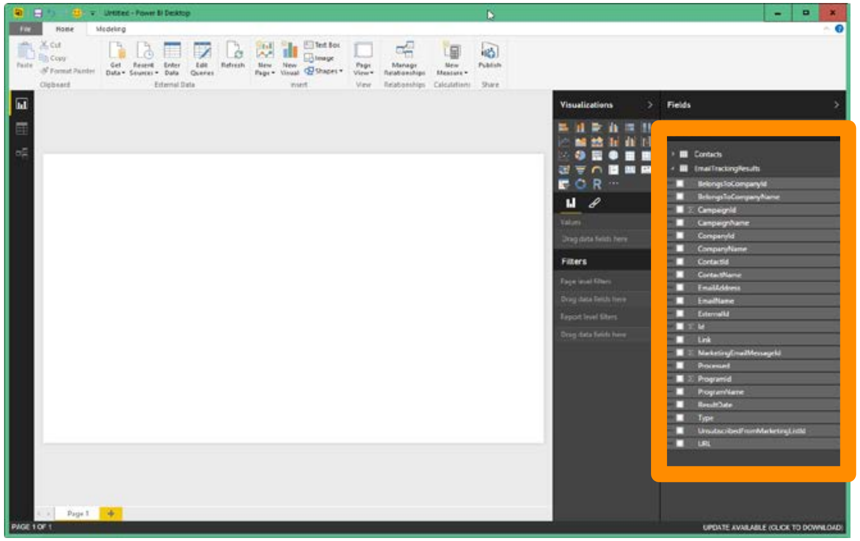


8. The **Navigator** window opens. This window enables you to choose which data feeds to connect to. Mark the check box for **EmailTrackingResults** and **Contacts** and then click **Load**.



Part 2: Create bar charts

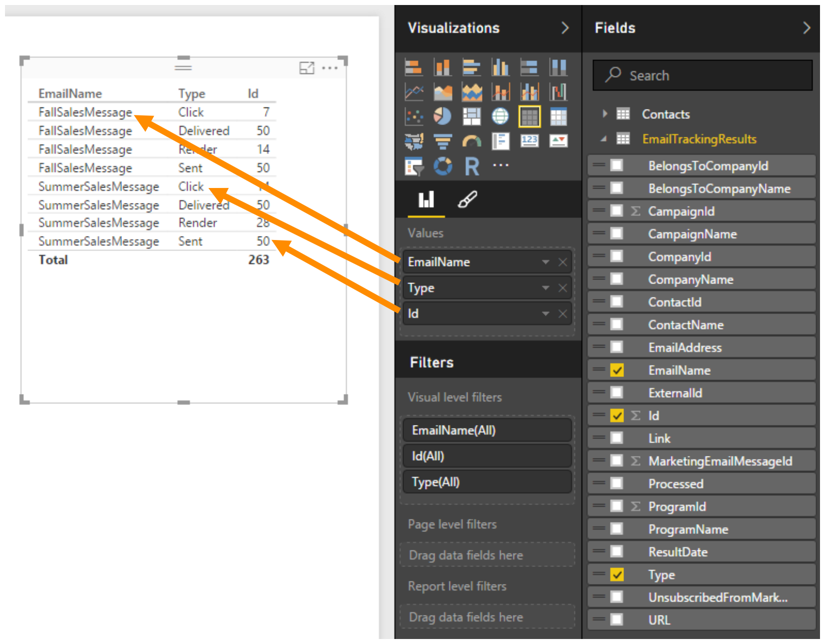
1. The Power BI Desktop App now loads data from your selected feeds, which may take several seconds depending on how much data you have. When it's done, you see the two feeds you chose listed in the **Fields** pane. Expand the **EmailTrackingResults** feed to see the list of fields it contains.



2. Under the **EmailTrackingResults** feed, mark the following check boxes (in this order):

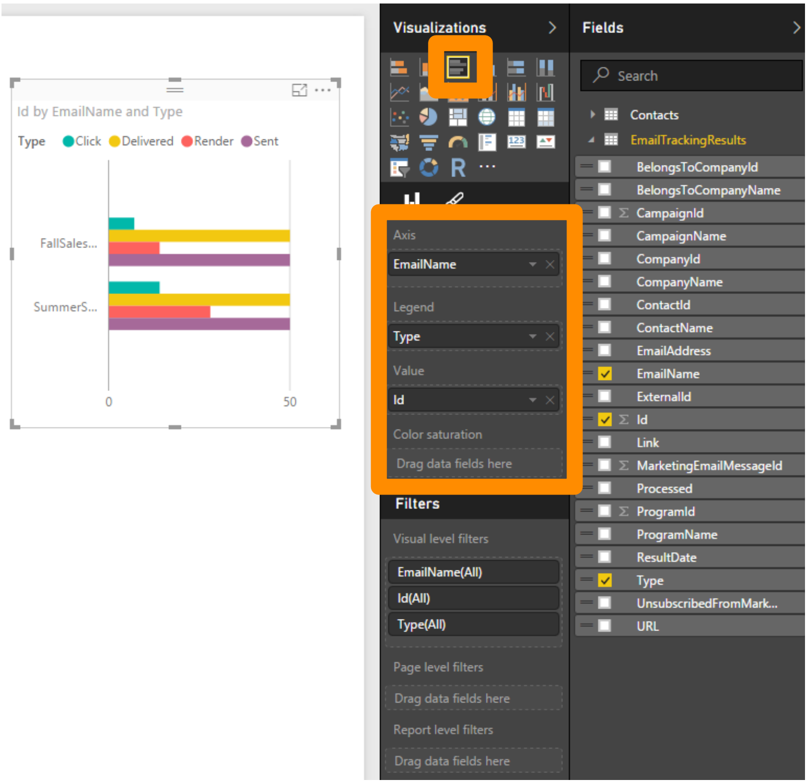
   - **EmailName**: This is the name assigned to each email message for which tracking results were collected.
   - **Type**: This is the type of result that was recorded. Possible values are: *sent* (a message was sent to a contact), *delivered* (the message was not blocked or bounced), *render* (a contact opened the message and loaded images), and *click* (a contact clicked a link in the mail).
   - **∑ Id**: This is the unique identifier column from the table, but we will use it to count the number of unique IDs that have a given EmailName and Type (which is why it is prefixed with a sigma). The result will be to count, for example, how many times a given email was clicked on.

3. Note that when you click the first checkbox, you create and select a new table in the canvas area. Each additional box you select adds rows to that table. Also, each field that you add to the table also gets added under **Visualizations > Values**. You can drag and drop the fields under **Values** to rearrange the table if needed. When you are done, your result should resemble the following:



Part 2: Create bar charts

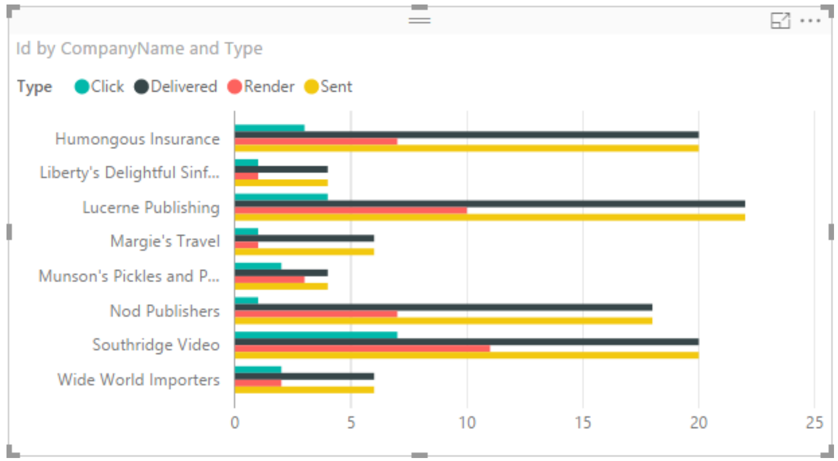
4. With the table selected, click on the **Clustered bar chart** button at the top of the **Visualizations** pane. Your data table now turns into a bar chart, and the fields you picked are now assigned logical roles in the chart, with the email name on the Y-axis, the ID count along the X-axis and the result types shown in the legend, each indicated by a colored bar.



5. Don't forget to save your work. Click the **Save** icon in the menu bar and choose a name and location for your Power BI file.

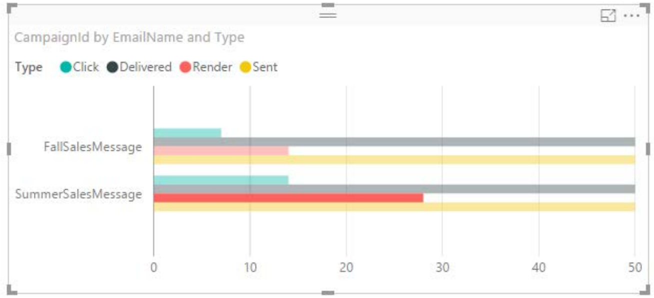
6. Deselect your current bar chart by clicking away from it anywhere on the canvas. Under the **EmailTrackingResults** feed, mark the following check boxes (in this order):
   - **CompanyName**: This is the company associated with each contact that the message was sent to.
   - **Type**: This is the type of result that was recorded (same as before).
   - **∑ Id**: The result count (same as before).

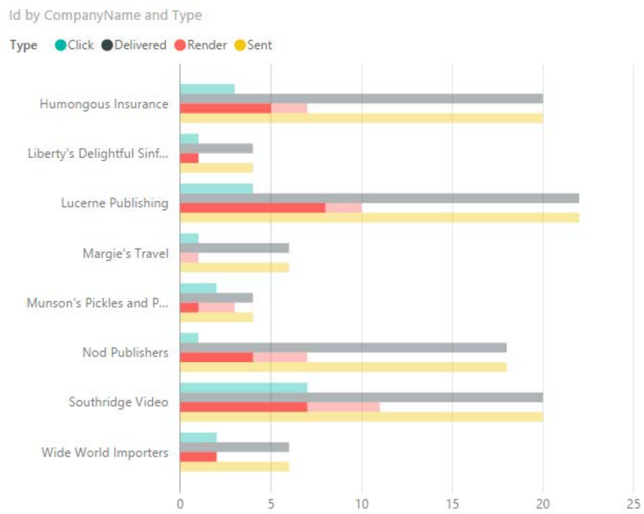
7. You should now see a new table, which is probably a bit larger than the last one (provided you have company information in your data). With this new table selected, click on the **Clustered bar chart** button to convert the table to a bar chart. This time, the chart shows email results per company rather than per email.



Part 2: Create bar charts

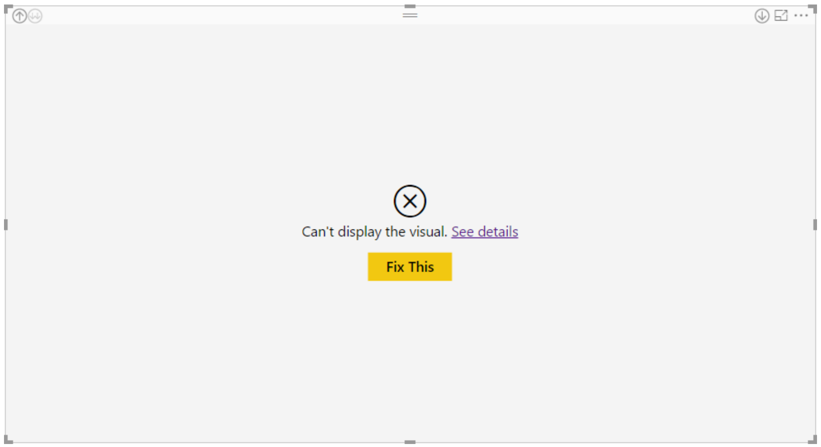
8. Arrange your two charts in a logical way by dragging and dropping them and using the resize handles to resize them.
9. Try clicking on the various bars in the two charts. Notice that each time you select a bar, all the charts on the page indicate which other bars include your selected data. For example, if you choose the **Render** (open) bar for a particular email message, the company list updates to indicate the portion of each company's open results that came from that message. Likewise, if you select the **Render** bar from the company list, the message list updates to indicate which portion of each message's open results came from that company.



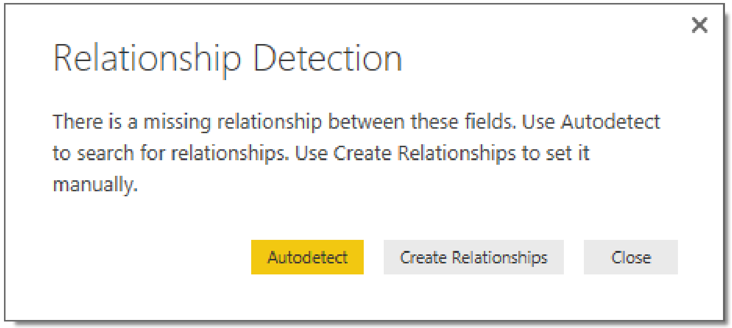


Part 3: Add a map to show geographical data

1. Clear your column selection by clicking on one of your charts, but away from any columns. Then deselect all your charts by clicking in an empty area of the canvas.
2. Now we'll add just one more chart, this time to show geographical information. Start by marking the following check boxes (in this order) under the **EmailTrackingResults** feed:
   - **Type**: This is the type of result that was recorded (same as before).
   - **∑ Id**: The result count (same as before).
3. With your new table still selected, expand the **Contacts** feed in the **Fields** pane and mark the **City** check box. You should now see an error message. This error occurs because you added a field from a foreign table to a visualization that, until now, showed data from just one data table. Power BI needs to know how the two tables are related before it can understand how to combine the data.

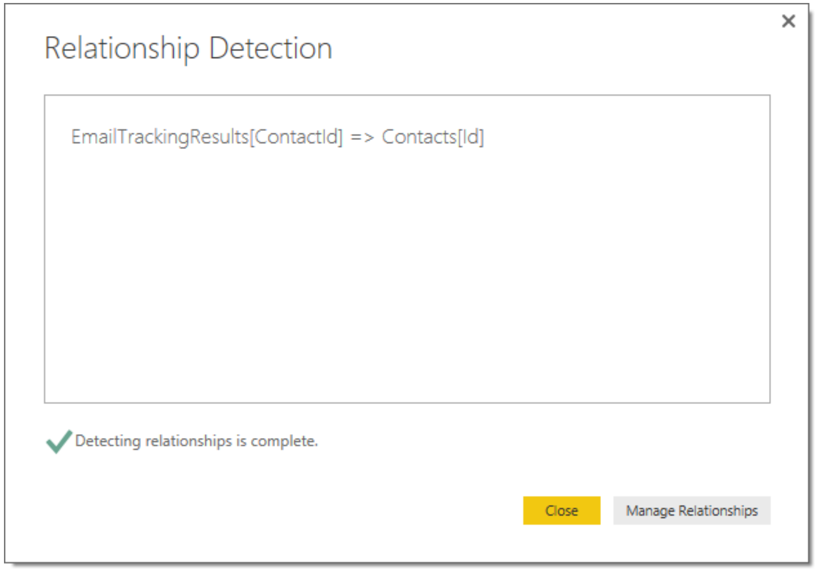


4. Click the **Fix This** button. The **Relationship Detection** window opens, with a diagnosis of your problem. Because the Dynamics Marketing OData feed is formatted with consistent naming, we can expect that Power BI can easily figure out what the relationship should be, so just click **Autodetect**.

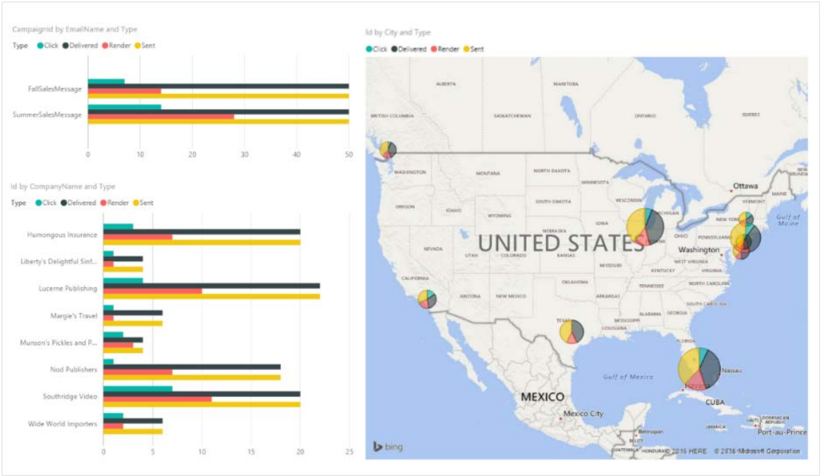


Part 3: Add a map to show geographical data

5. Power BI shows the result of the autodetection, which should be correct, so just click **Close**.



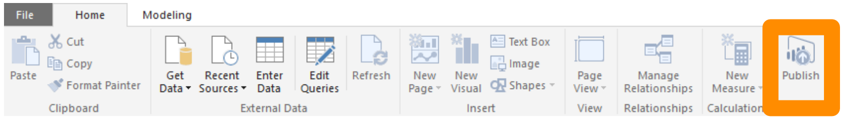
6. With your new table still selected, click the **Map** button to convert it into a map (don't use the **Filled Map**). The table now converts to a map with pie charts superimposed over the relevant cities. If you'd like, resize the map to take up most of the remaining room on your canvas, and then use your mouse scroll wheel to zoom and drag the map to a position where you see the most interesting data.



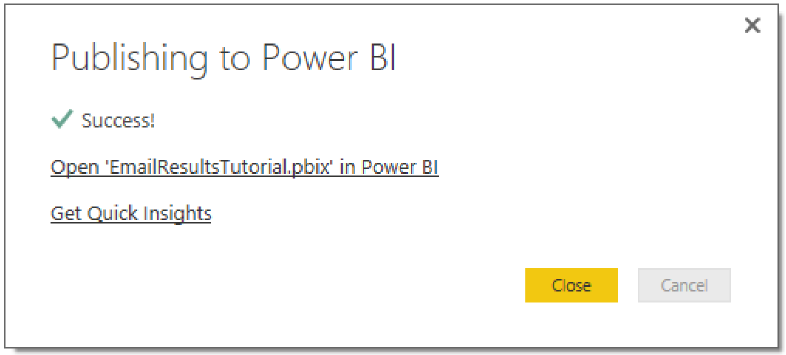
7. As before, try clicking the various colored bars and pie charts on the page. Note that all the displays change to highlight the types of data that you choose.

Part 4: Publish your report and set up a Power BI dashboard

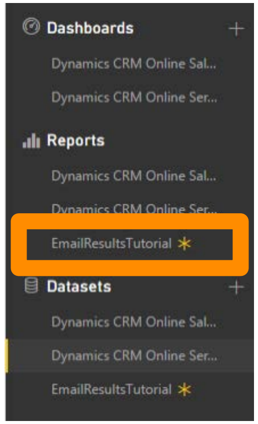
1. From the ribbon's **Home** tab, click the **Publish** button.



2. If you are asked to save your file, click **Yes**. If you are asked to sign in, then sign in using an Office 365 account where you have a trial or full license for Power BI. When the publish is finished, you're given the chance to go directly to your new report on the Power BI site. Click the **Open** link (or, if that doesn't work then open a browser and navigate manually to the Power BI account where you published the report).



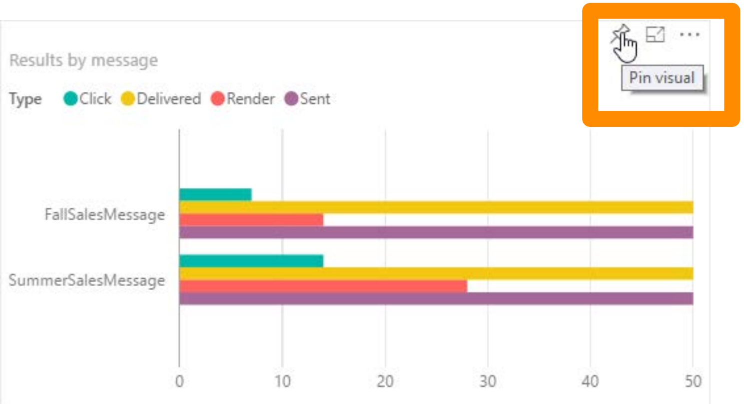
3. You should now be in your web browser, looking at your Power BI site, which should now include a new dataset and report, each showing the same name that you used when saving your work locally with the Power BI App. The new items are marked with a yellow asterisk. You should see them listed in the navigation pane on the left. (Click the **Show navigation** button at the top-left if you don't see the pane)



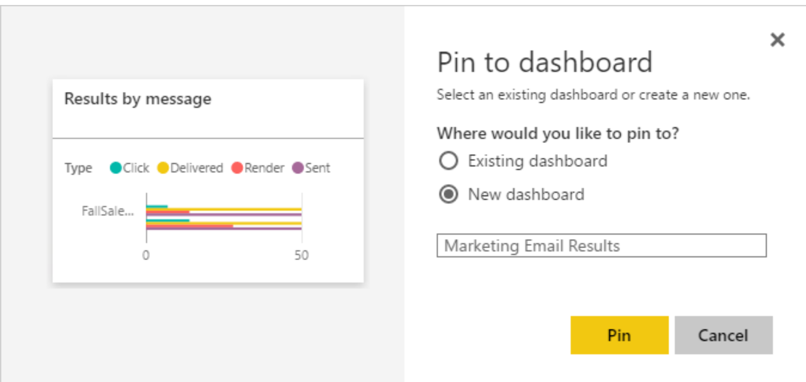
4. In the **Navigation** pane, click the new item under the **Reports** heading. You should now see the report that you just published from the Power BI Desktop App.

Part 4: Publish your report and set up a Power BI dashboard

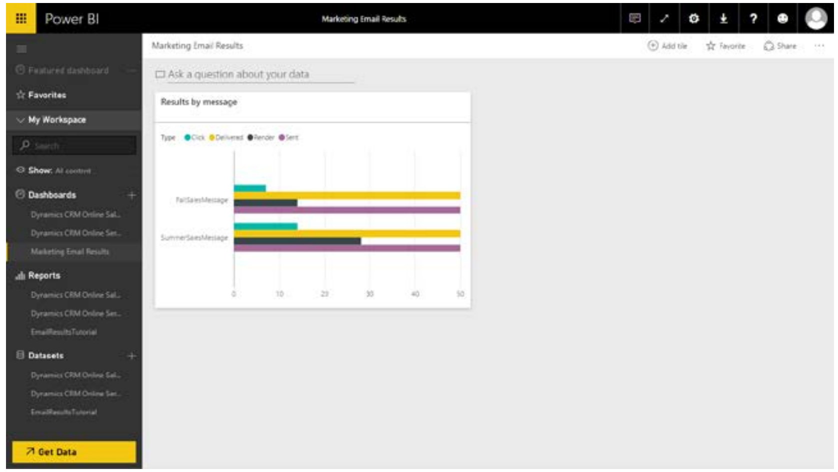
5. Your report should contain three visualizations. Choose the one that seems most useful and hover your mouse pointer in the upper-right corner. Then click the **Pin visual** button shown there.



6. The **Pin to dashboard** dialog window pops up. Mark the **New dashboard** radio button and enter a name for your new dashboard in the field provided (such as "Marketing Email Results"). Then click the **Pin** button.

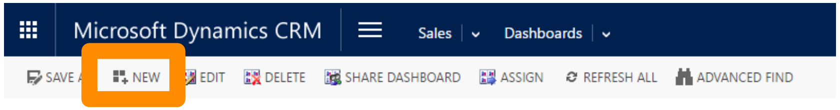


7. A new dashboard, showing the name you gave it, is now added to the **Dashboards** list in the navigator pane.

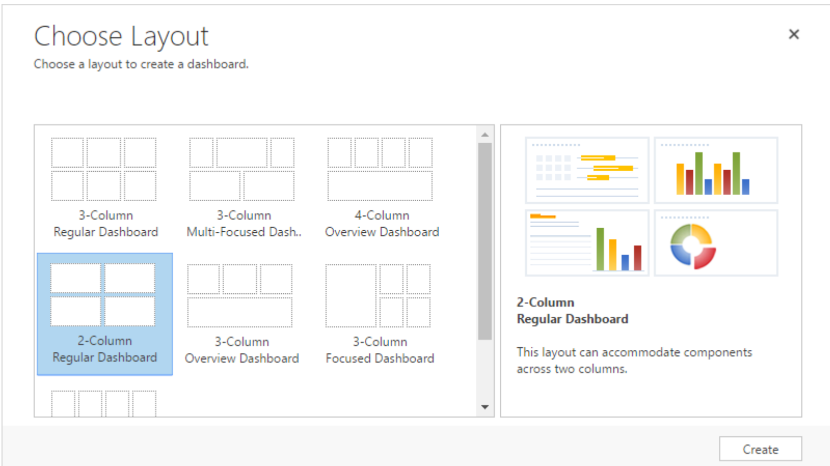


Part 5: Add a Power BI tile to your Dynamics 365 dashboard

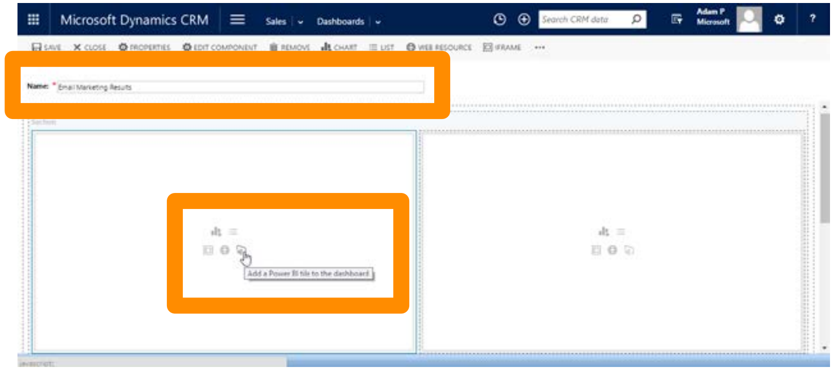
1. Sign in to Dynamics 365 using the same Office 365 account that you used in Power BI and Dynamics Marketing.
2. Go to any **Dashboard** view that is available to you in Dynamics 365. For example, dashboards are available under the **Sales**, **Service**, and **Marketing** navigation tiles.
3. Click the **New** button in the **Dashboards** tool bar.



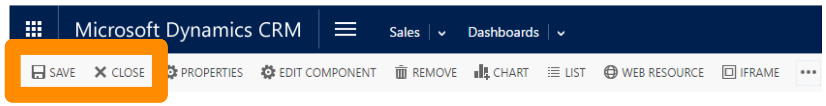
4. The **Choose Layout** dialog window opens. Choose 2-column layout (or any other layout you like) and then click **Create**.



5. A new, empty dashboard is created for you. Enter a **Name** in field provided and then click the **Power BI** icon shown in the middle of an unassigned tile.

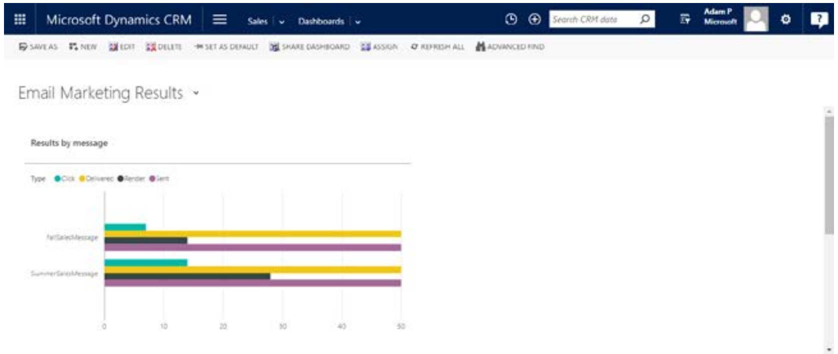


6. The **Power BI Tile** dialog window opens. Choose the **Power BI Dashboard** that you created earlier in this procedure and then choose a **Tile** name. Click **OK** to add the tile to Dynamics 365.
7. Click **Save** and then **Close** from the **Dashboards** tool bar.

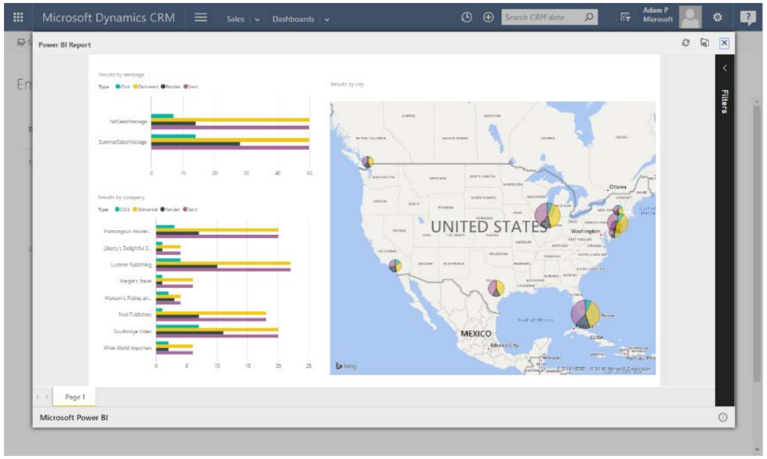


Part 5: Add a Power BI tile to your Dynamics 365 dashboard

8. You should now have a simple dashboard with your preferred visualization displayed as a tile.



9. Click anywhere on the tile to open the related report right inside of Dynamics 365. You should now see all three of the visualizations that you added to your report. You can explore the data, just as you could in the Power BI App, by clicking any colored bar or pie chart; all tiles update to highlight your selected data.



Next steps

You have now closed the loop from data source through visualization and design, publishing, and embedding in Dynamics 365. Now you should go back and experiment further with each step to create visualizations that fit your own data and business. For example:

- Try to work with other data tables and data sources
- Try other types of visualizations
- Add more tiles to your Dynamics 365 dashboard

To learn more about each of these stages, go back to the Learning area at Powerbi.com where you can watch videos and read tutorials that will teach you about how to use all the various types of visualizations, create more advanced queries and data transformations, use Power BI with Microsoft Excel, and more.

A good way to learn is by studying examples. Try downloading one of our content packs as a PBIX file, which you can then open, inspect, and customize using the Power BI Desktop App. For a how-to guide, see Customize Microsoft Dynamics 365 Power BI content packs.

A downloadable collection of Power BI Excel workbooks is available for use with Dynamics Marketing. These are similar to the content packs for Power BI, but include even more visualizations and can be viewed offline. For details about how to download and use these, see Download, connect, and customize sample Power BI workbooks.

Congratulations!

You have completed this introduction to using Power BI to create powerful, custom analytics solutions for the Dynamics 365 family of products. You should now know how to:

- Enable Power BI for Dynamics Marketing and/or Dynamics 365 (online)
- Connect Power BI to your Dynamics Marketing and/or Dynamics 365 (online) instance
- Run the Power BI online portal and desktop app
- Create and publish data visualizations
- Set up a Power BI widget in Dynamics 365

To find more tutorials, videos, eBooks and online help for Dynamics 365 products, visit the Dynamics 365 Customer Center.

Thanks for reading!

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