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**DEVELOPERS’
CONFERENCE**
June 15–17, 2021

Best practices in merging capabilities of Microsoft Power BI with Blackbaud CRM™

Blackbaud CRM™ Track

REBECCA SUNDQUIST

Session Host: Jim Ballou



Safe Harbor Statement

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Customization of Blackbaud Solutions

As a Blackbaud customer, your Authorized Support Contacts retain the responsibility for providing internal support for Customizations of your Blackbaud solutions by:

- Providing direct support to answer questions regarding Subscription functionality, internal business practices, and troubleshooting processes to Your Non-Authorized Users
- Providing direct support to answer questions regarding Customization specifications, features, intended usage, and Error correction and troubleshooting processes to Your Non-Authorized Users

Hello! I'm Rebecca Sundquist

Pronouns: She/Her/Hers

HOMETOWN: KANSAS CITY, MISSOURI

AT BLACKBAUD: 17 YEARS

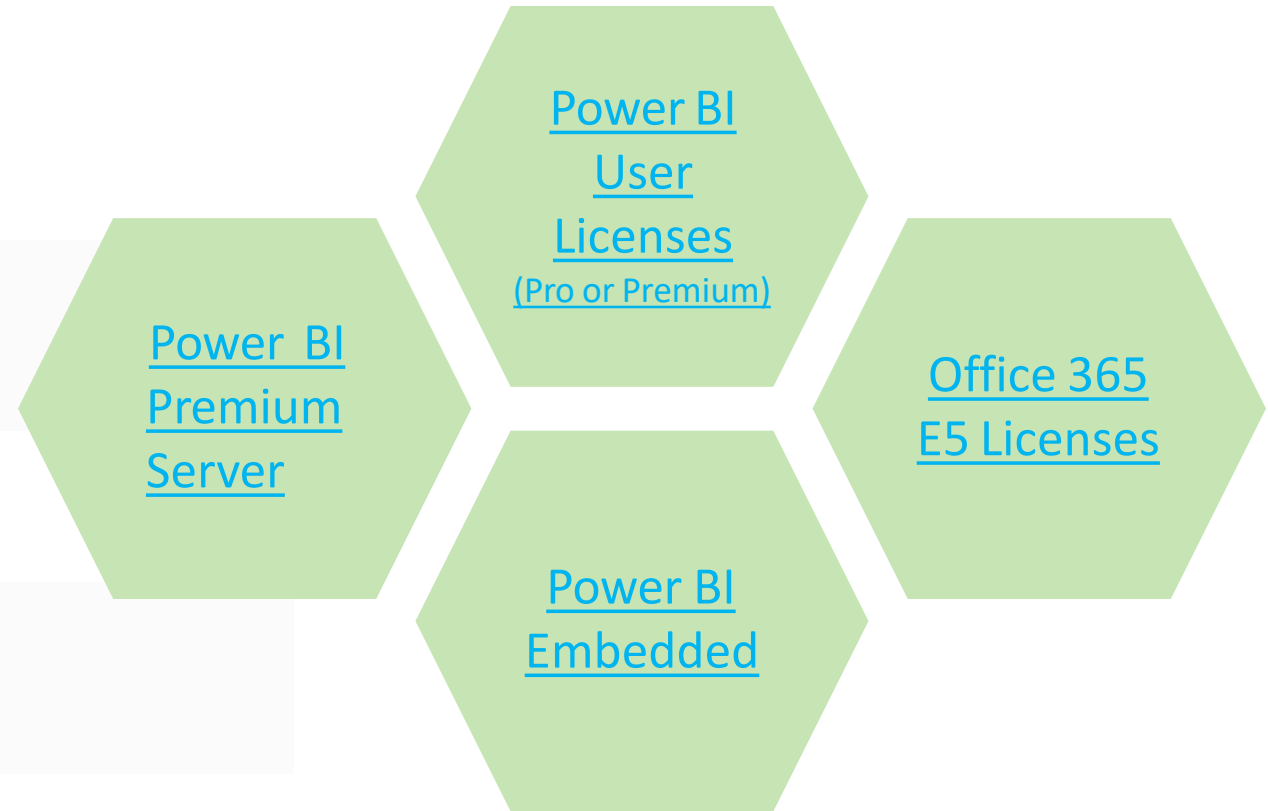
Passionate about literacy, I volunteer as a reading mentor in my neighborhood school. I am also passionate about data literacy, consulting with clients to turn data into information.




This session is for BBCRM organizations who are

Current Power BI Users

Interested in Power BI



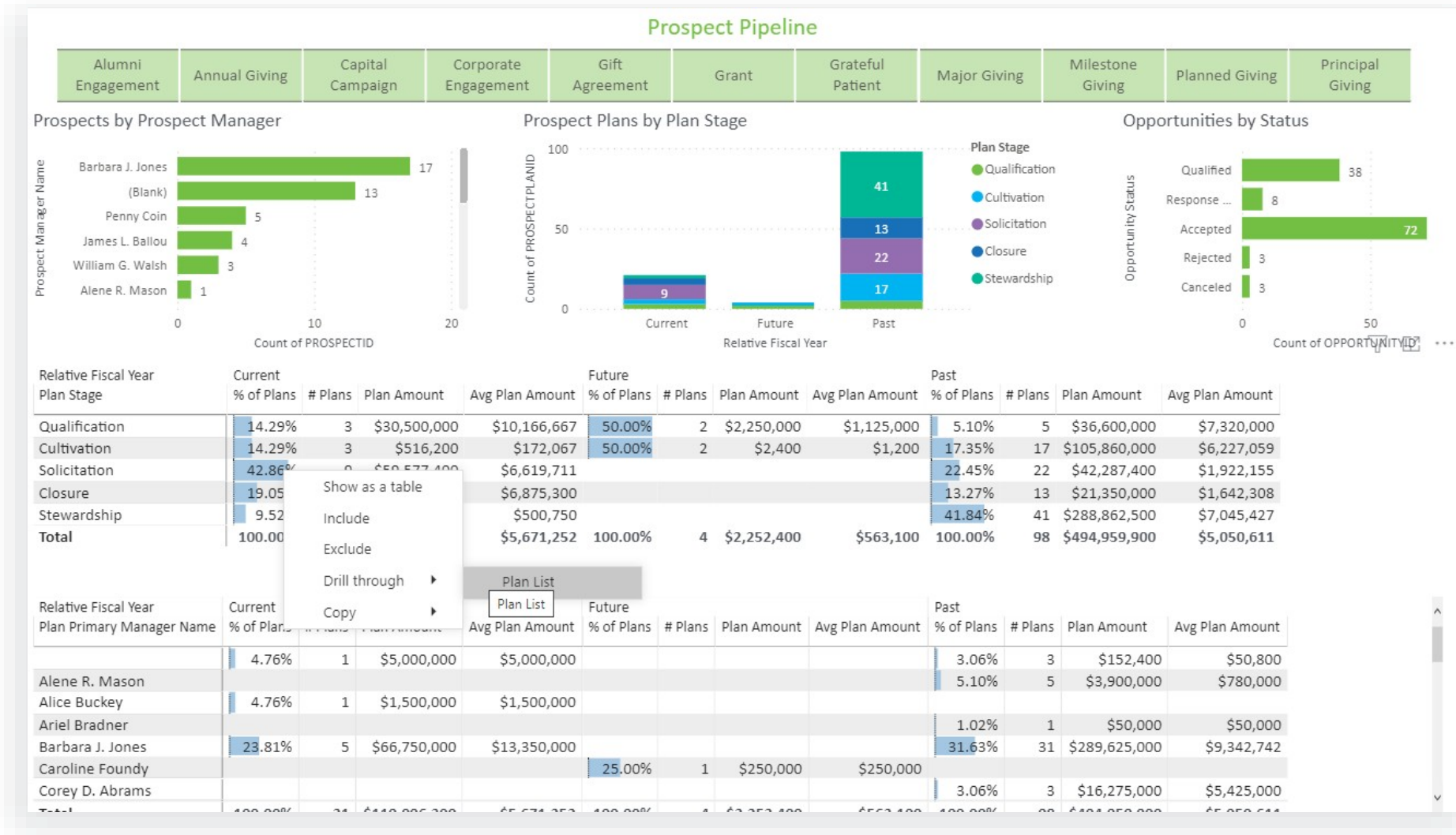
Agenda

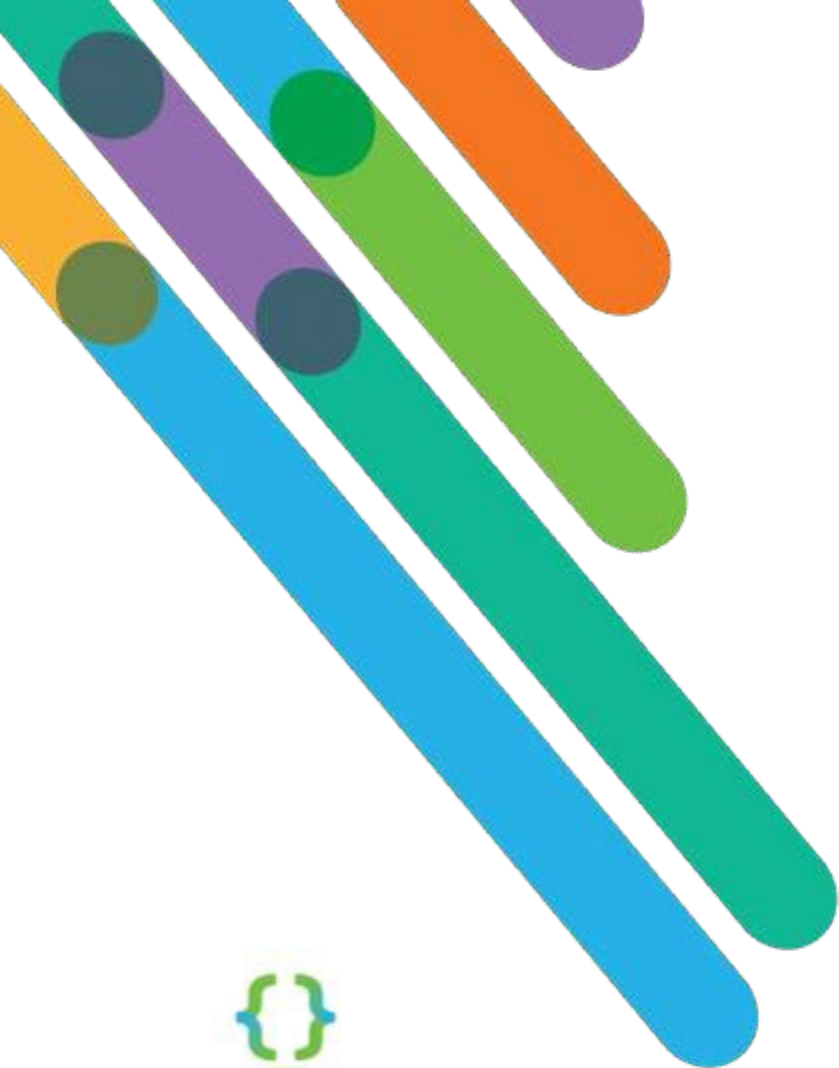


Demo	Demonstrate embedded Power BI report in Blackbaud CRM
Connect	Connect Power BI to BBCRM Data Sources
Create	Create Power BI Dataset and Report
Embed	Embed Power BI Reports into BBCRM Pages
Maintain	Maintain Power BI Reports on Power BI Service with a Data Gateway

Demo: Prospect Pipeline

Prospects, Plans,
and Opportunities
cross-filterable and
with drill-through
to record detail





Connect to BBCRM

CONNECT POWER BI DESKTOP TO BBCRM DATA SOURCE



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Connect Power BI Desktop to Blackbaud CRM

On-premise and Hosted environments have connection options

Mashup CRM data source(s) with your own source(s)

On-premise SQL Server / Read-only access (Azure)

Connecting to your on-premise SQL Server or Azure hosted read-only access is the **recommended connection** due to easy maintenance across reports and most thorough access to objects in OLTP and BBDW databases. Requires data gateway.

OData

Built-in feature allows access to ad-hoc query results. Requires data gateway when using Basic authentication.

Data list end point

Built-in feature allows access to ad-hoc query results with parameterization and provides data type definitions to Power Query. Does not refresh on Power BI Service when SSO is enabled.

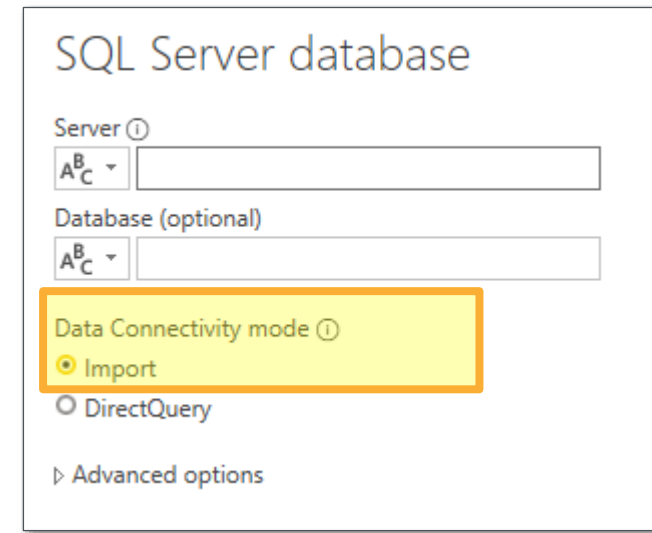
Replicated data store / Scheduled backups

This offering requires offline maintenance of SQL Server backup restorations. Then connect Power BI to your on-premise backup server via data gateway.

Import into Power BI Desktop

Use the **Import** connectivity mode to take advantage of Power BI's advanced features.

Note that refreshes on Power BI Service of imported SQL Server datasets (such as an on-prem SQL database or the read-only access connection) must route through a [data gateway](#), where credentials for the CRM connection are stored centrally.



SQL Server database

Server ⓘ
A^BC ▾

Database (optional)
A^BC ▾

Data Connectivity mode ⓘ
 Import
 DirectQuery

▸ Advanced options

[Import vs Direct Query](#)



Trick: Connecting to Query Views

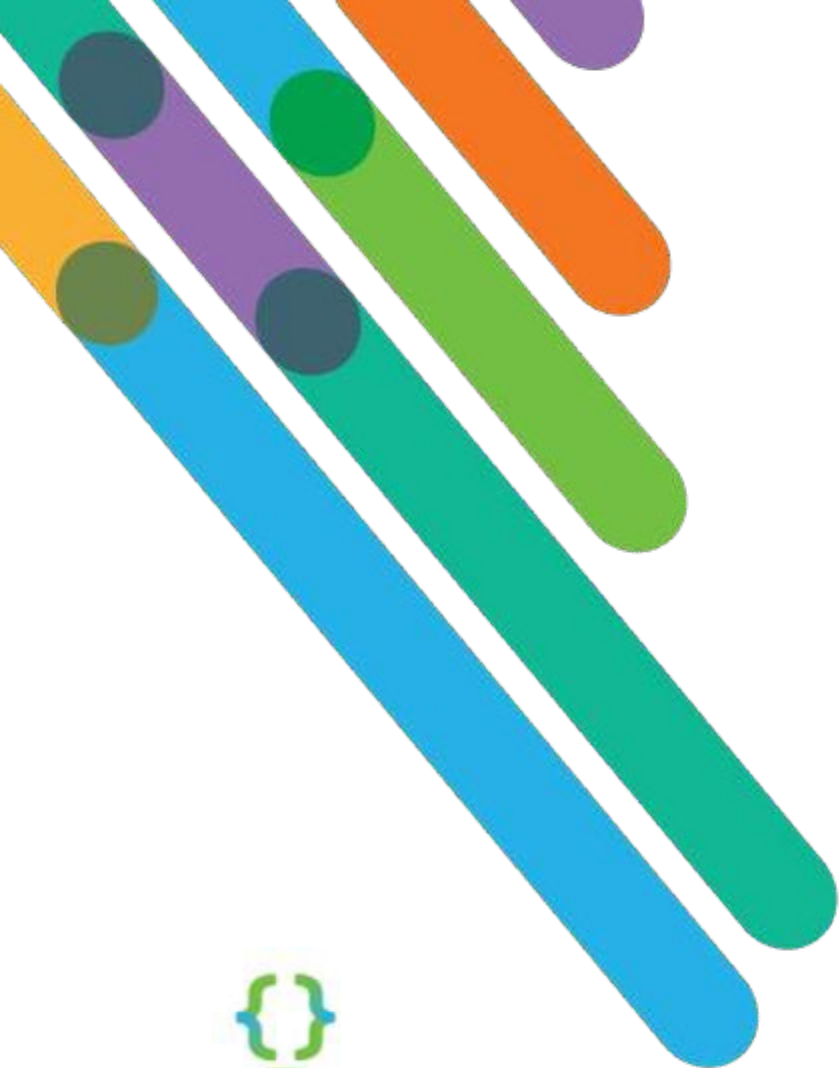
Challenge:

You will often want to use query views that are already optimized for ad-hoc query. Power BI displays top 10,000 objects from SQL Server database in Navigator window. “V_Query...” views do not show up within the top 10,000.

Solution:

1. Select any table from the SQL Server data source in the Navigator window.
2. Open **Power Query** by clicking the “Transform Data” icon on the “Queries” menu bar.
3. Select the query you need to update from the “Queries” list. Update the name of the query under “Properties.”
4. Under “Applied Steps,” click on the “Navigation” step.
5. Alter the “Item” value in the M Query.

The screenshot shows the Power BI interface with the M Query editor and the Query Settings pane. The M Query editor displays the following formula: `= Source{[Schema="dbo", Item="V_QUERY_PROSPECT"]} Data`. The `Item="V_QUERY_PROSPECT"` part of the formula is circled in orange. The Query Settings pane is open, showing the Properties section with the Name field set to `V_QUERY_PROSPECT`. The Applied Steps section shows the Navigation step selected. The Queries list on the left includes `V_QUERY_PROSPECT`.



Create Dataset and Report

CREATE DATASET IN POWER BI DESKTOP AND PREPARE A REPORT TO PUBLISH



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Create Power BI Model

Power BI's Model is a Tabular Relationship – not “flattening” data via joins

Example: Connect Prospect Plans and Plan Steps without duplicating Prospect Plan records.

Create custom dimensions

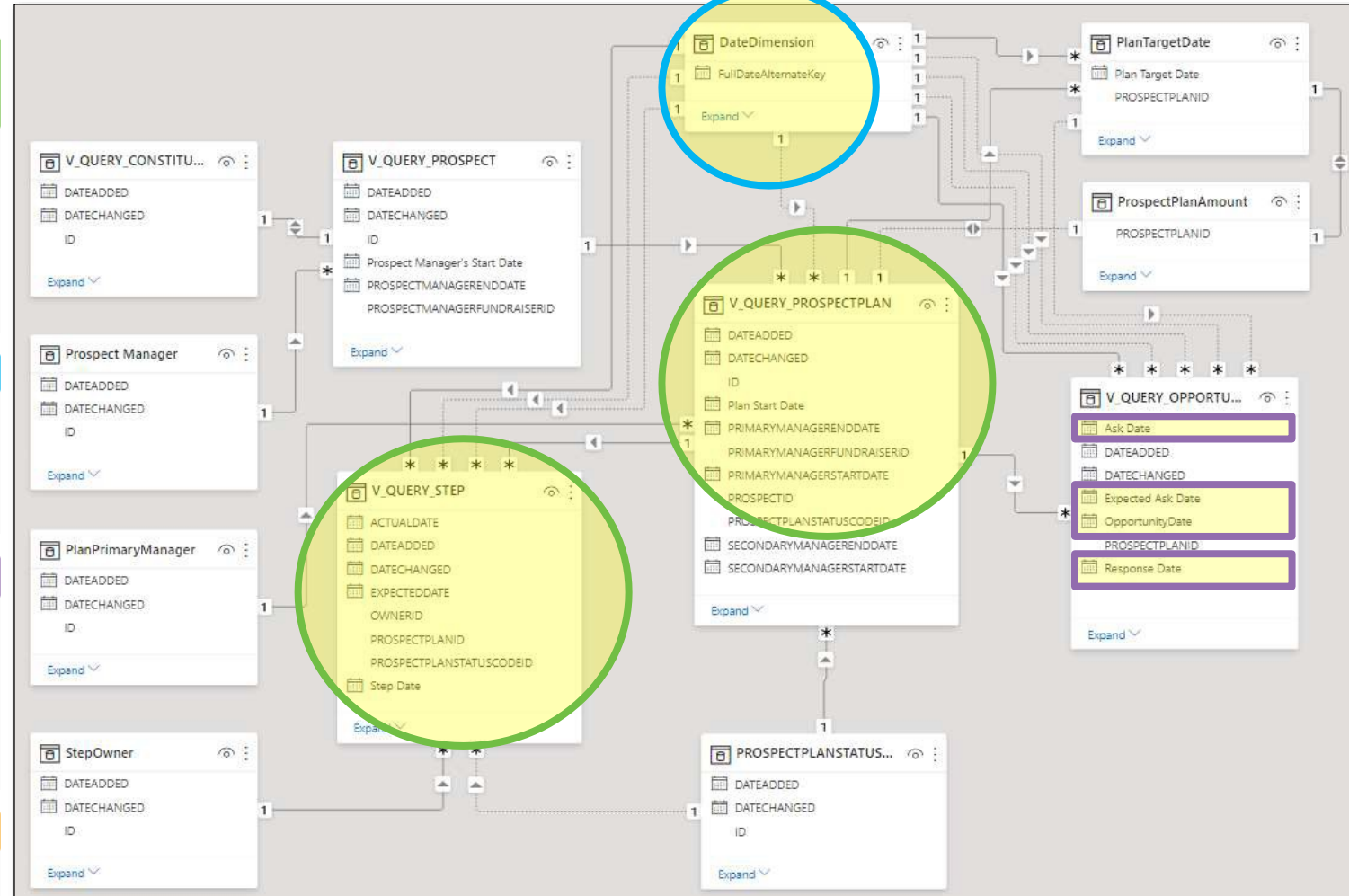
Example: Custom fiscal periods in custom DateDimension

Role-playing dimensions

Example: Ask Amount summed by Ask Date, while Accepted Amount summed by Date Received

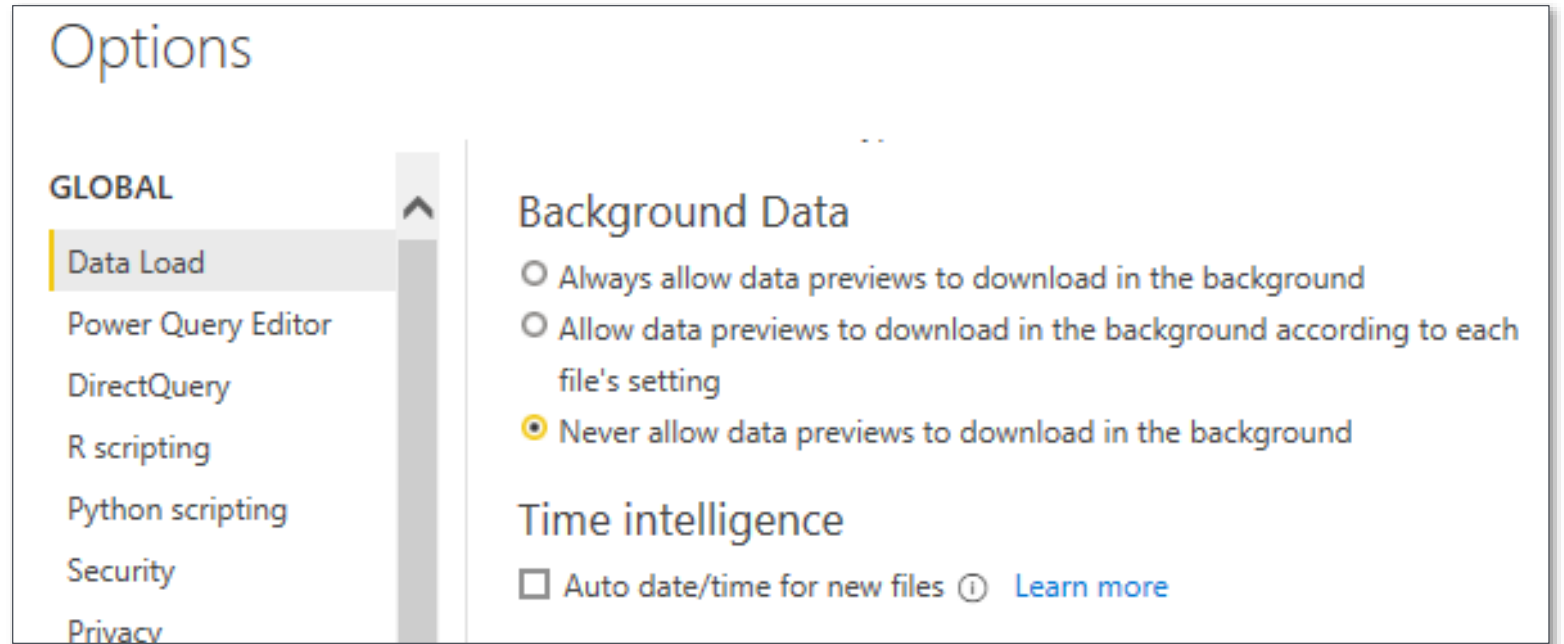
Time Period Comparisons built-in

Example: Compare to same period prior year.



Tip: Turn off Time Intelligence

Turn off Time intelligence under Global and Current File “Data Load” menu.



[Power BI Auto Date Time](#)



Trick: Year-to-Date comparison Year over Year

4/23/2021

ThroughDate

^ Year-to-Date comparisons are based on a "Through Date" calculated from most recent date any CRM user added or updated a Plan Step.

Use this date to calculate the column "IsYTD" on the date dimension.

Apply the date dimension's calculated column "IsYTD" as a page filter to view the year-to-date trend across years.

Roll-playing dimensions allow one date dimension to filter three metrics, each on a different date field:

Expected Ask Date, **Ask Date**, **Response Date**

Fiscal Year
FY 2020

v SAMEPERIODLASTYEAR() allows for comparison to prior year

Expected Ask Amount YTD



Ask Amount YTD

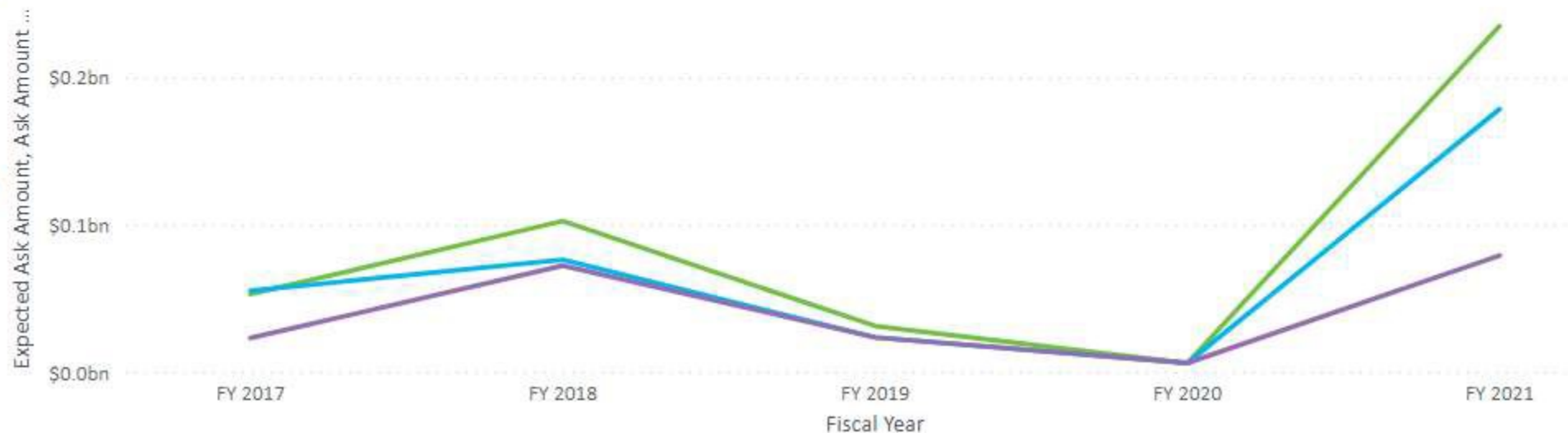


Accepted Amount YTD



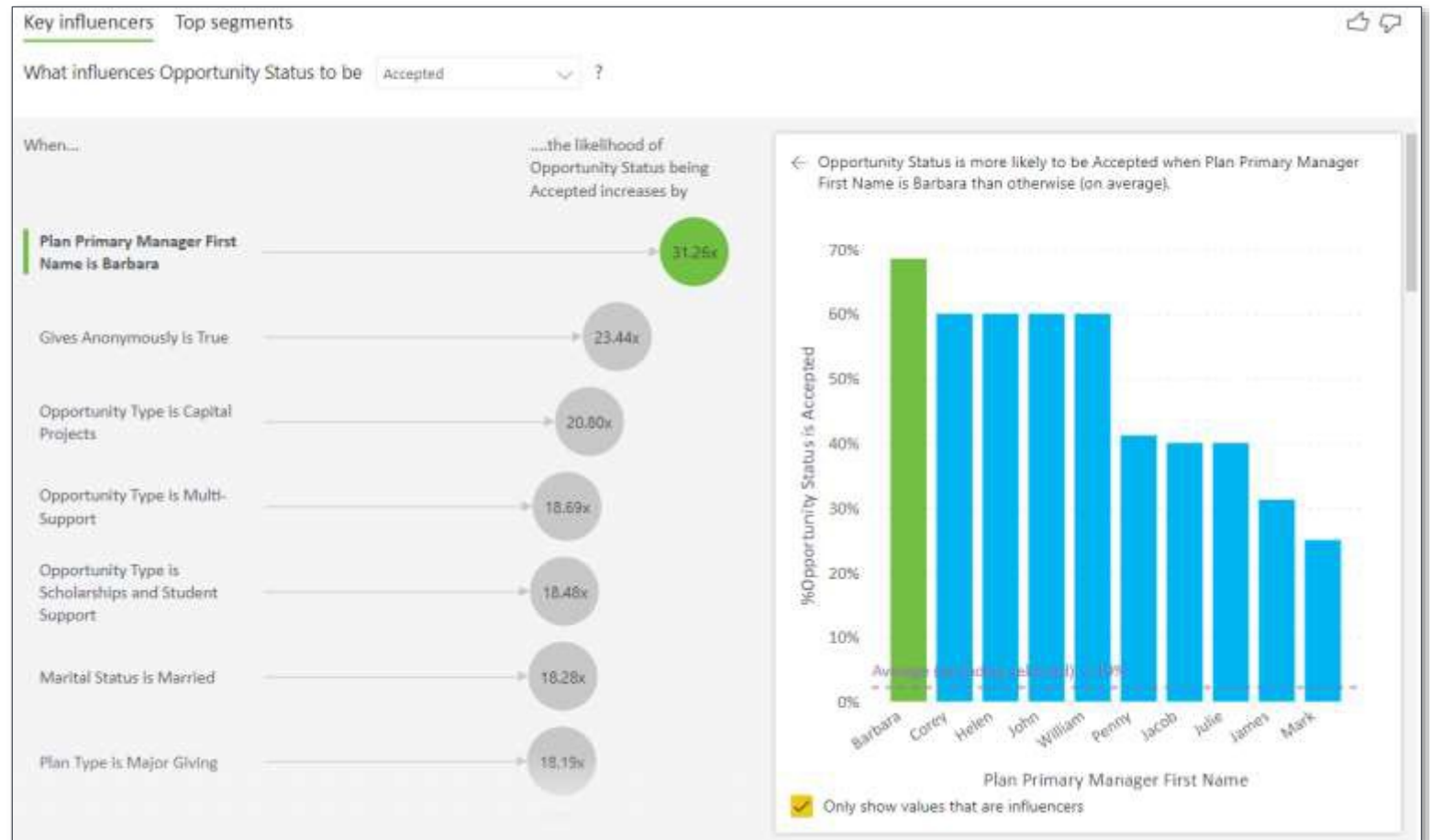
Year-to-Date Trend

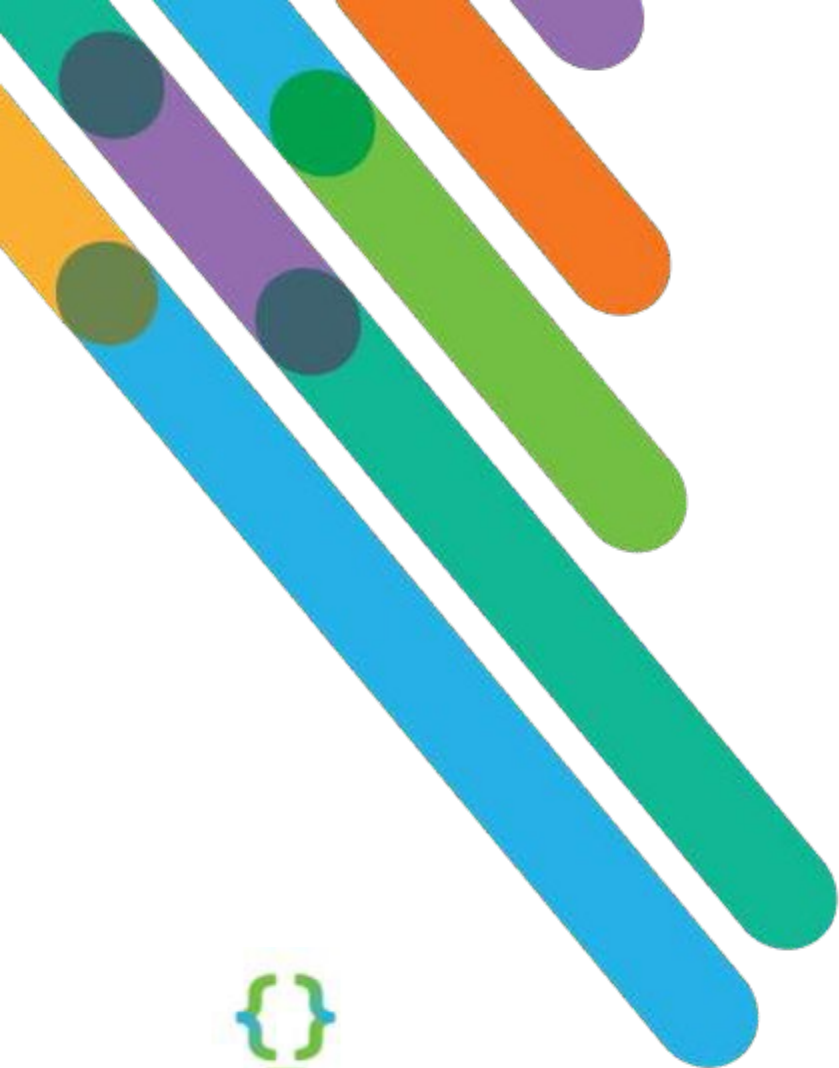
Expected Ask Amount Ask Amount Accepted Amount



Trick: Apply Artificial Intelligence

Key Influencers view is pre-built in Power BI, ready to analyze your CRM data source.





Embed in BBCRM

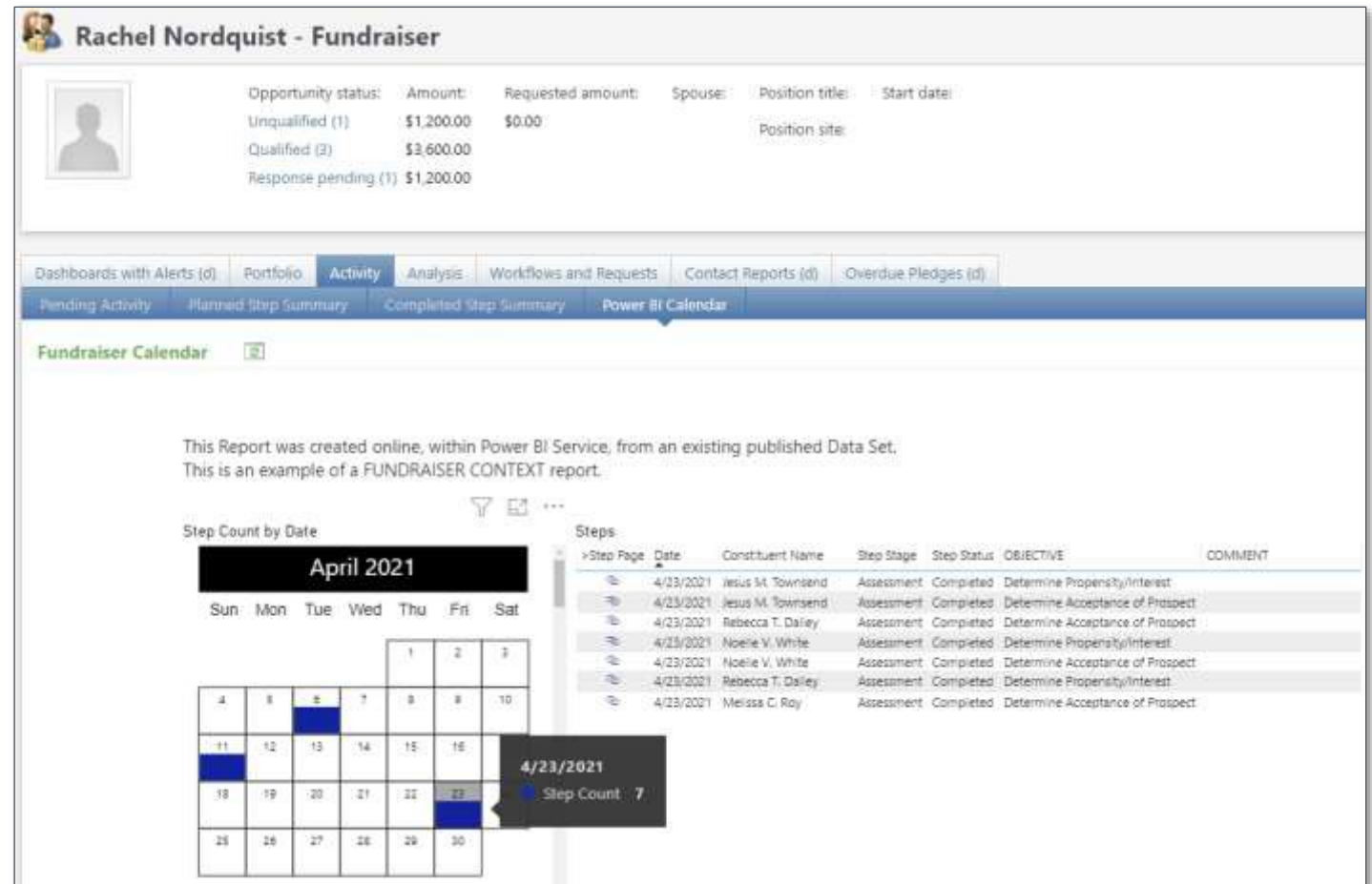
EMBED POWER BI REPORT IN BLACKBAUD CRM



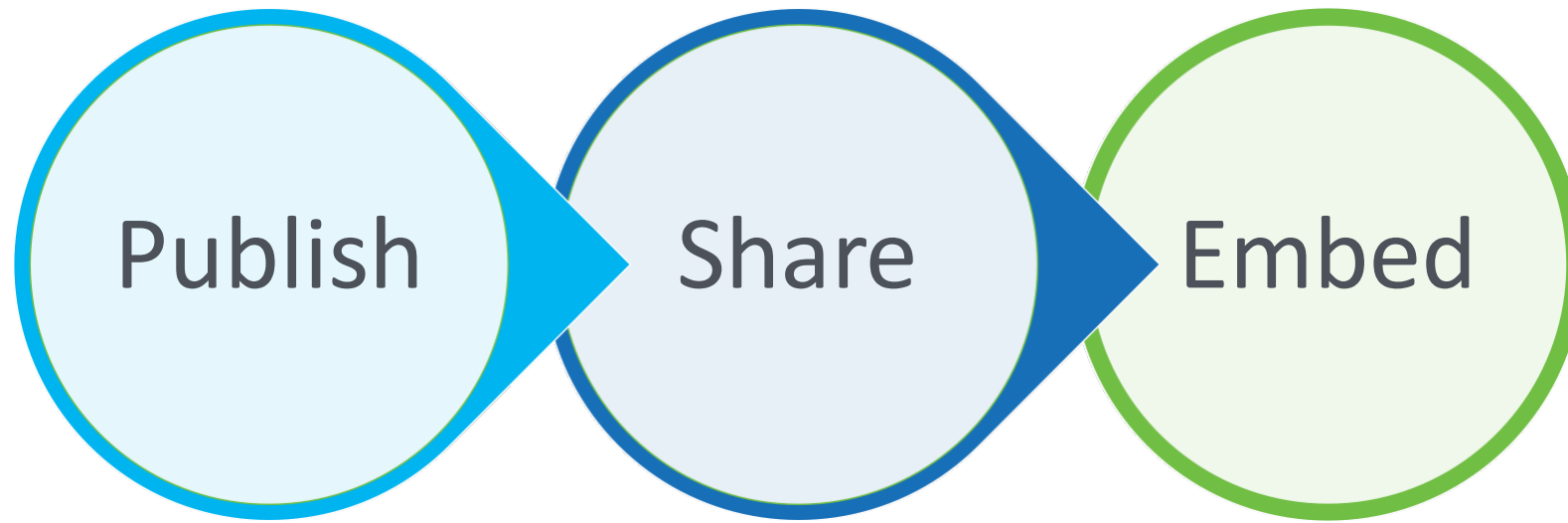
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Trick: Apply Page Context for Personalization

Interactive visualizations for your fundraisers



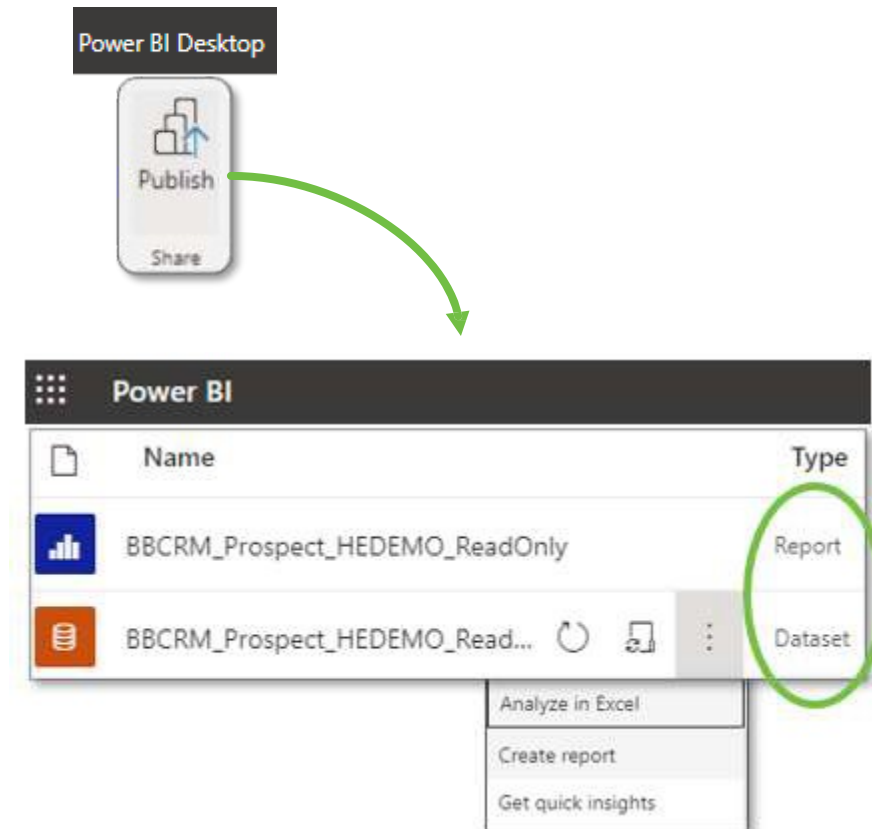
Steps to Embed



Publish

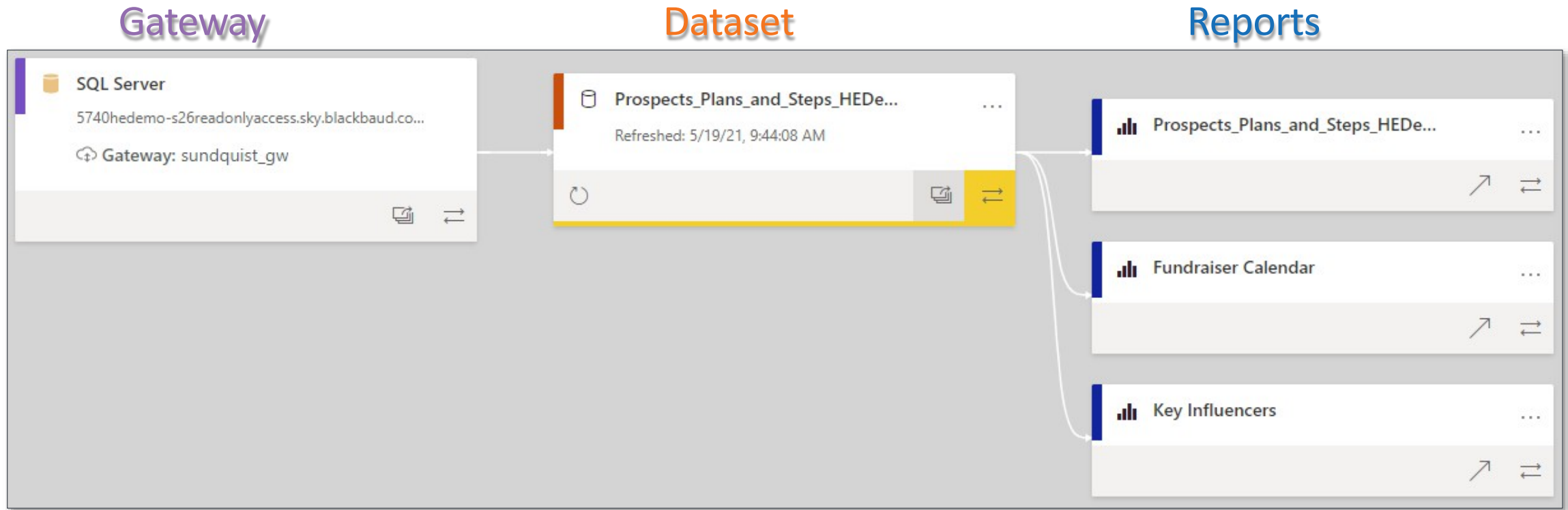
Power BI datasets are created and maintained in Power BI Desktop. User may create a report in this .pbix file too.

- When a .pbix file is published to the Power BI Service, the dataset and report are *both* added to the Power BI Service content.
- The dataset can be shared with other users to allow report creation online (in browser) from the published dataset. This ensures that all report developers are sharing the same data model for each functional area.



Tip: Build additional reports from central dataset

Now that you have a robust data model built in Power BI Desktop and published to Power BI Service, build additional reports referencing the published dataset.





Share

Licensing

Blackbaud does not provide Power BI licenses or hosting. Microsoft requires viewers to have Power BI Pro or Premium user licenses, unless the report is hosted under Premium Capacity or an Embedded license.

Authentication

Power BI Service requires each user to be logged into their Microsoft account, as the sharing of Power BI Content is managed by Microsoft.

Exception: Power BI Embedded license provides access to viewers with no Microsoft login.

Recommendation: Publish to Microsoft Workspaces where access is managed at the workspace level, not per artifact.

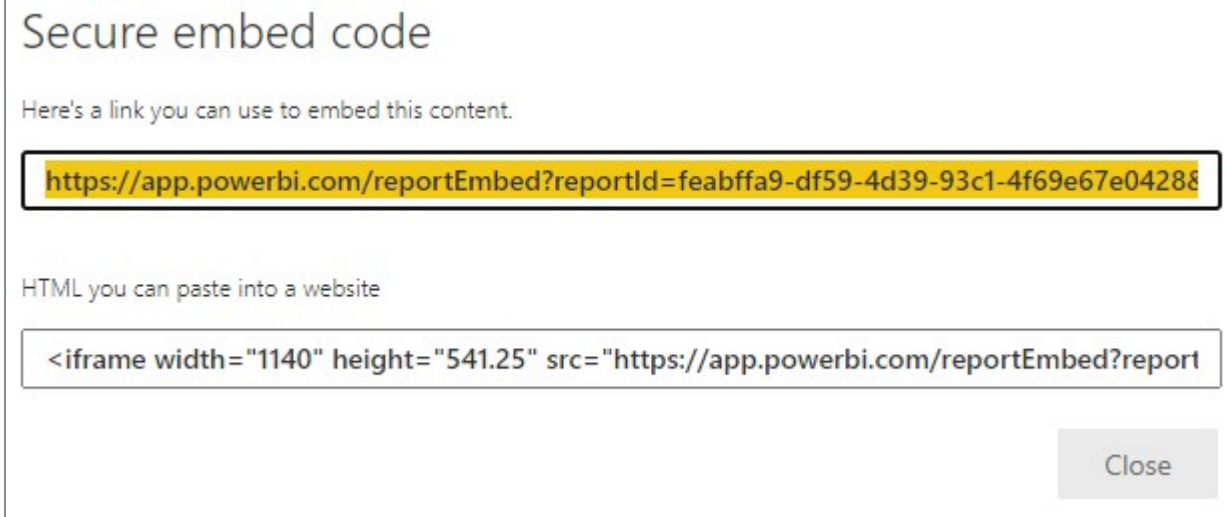
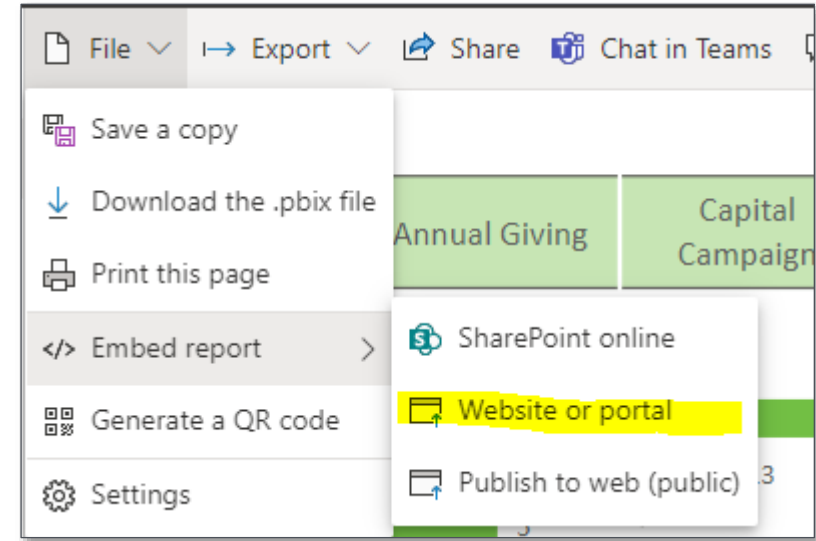
Embed

In Power BI Service, grab the Embed code from the report's File Menu

File > Embed Report > Website or Portal

Use the embed link (URL) to embed in a custom component in CRM. **<recommended**

Or use the HTML to configure an iframe display.



Embed

BBCRM Custom Component URLSection

Create a section with
SectionType =
“Custom Component”

CustomComponent =

Blackbaud.AppFx.Platform.UrlSectionClient.dll,Blackbaud.AppFx.Platform.UrlSectionClient.UrlSection

Edit section

Appearance

Caption: Power BI Example w Context

CaptionResourceKey:

HideCaption: False

Visible: True

HelpKey:

SectionType: CustomComponent

SectionDisplayStyle: Block

Collapsible: False

Collapsed: False

HideRefresh: False

Custom component

CustomComponent: Blackbaud.AppFx.Platform.UrlSectionCll

ContextType: PageContext

Parameters: (Empty)

ShowBorder: False

CustomComponent
Identifies the custom user component to call. Use assemblyname,classname.

OK Cancel

Embed

Pass context from the BBCRM page to the Power BI report

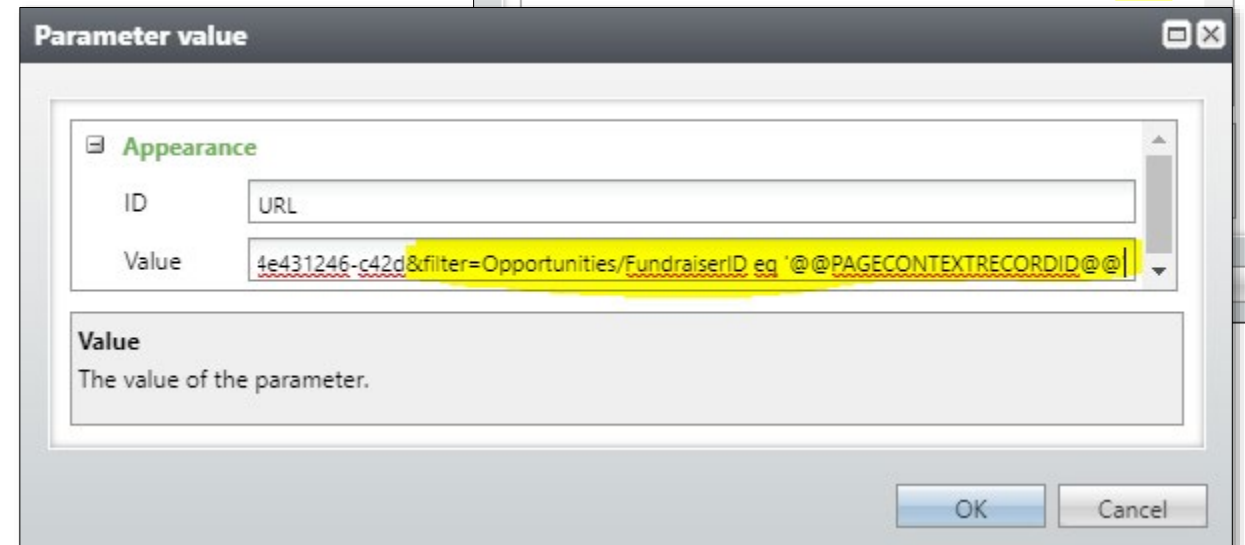
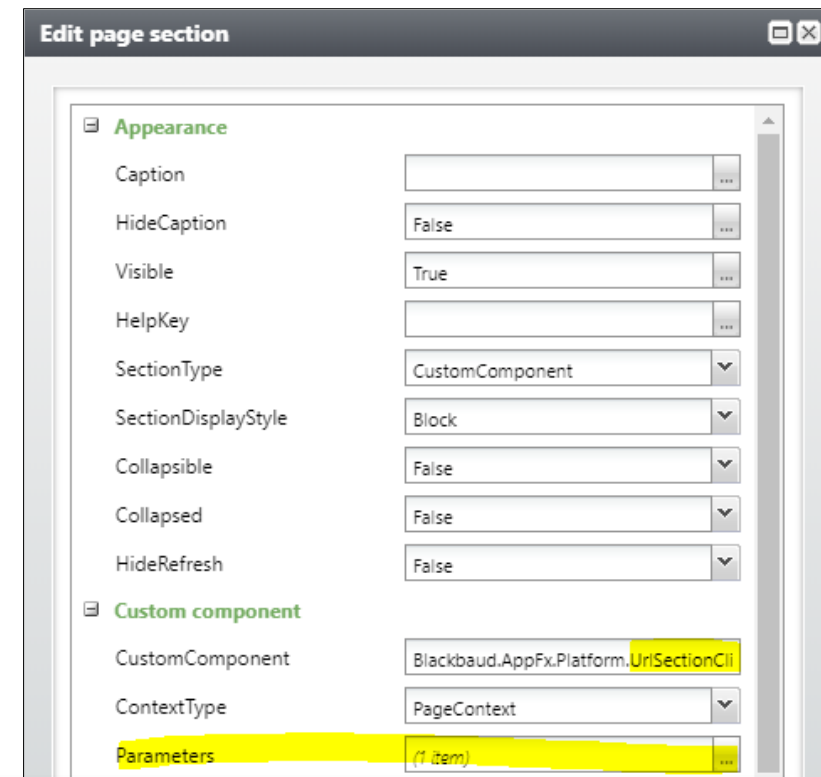
Use the Parameters within the CustomComponent to reference the Power BI embed code (URL)

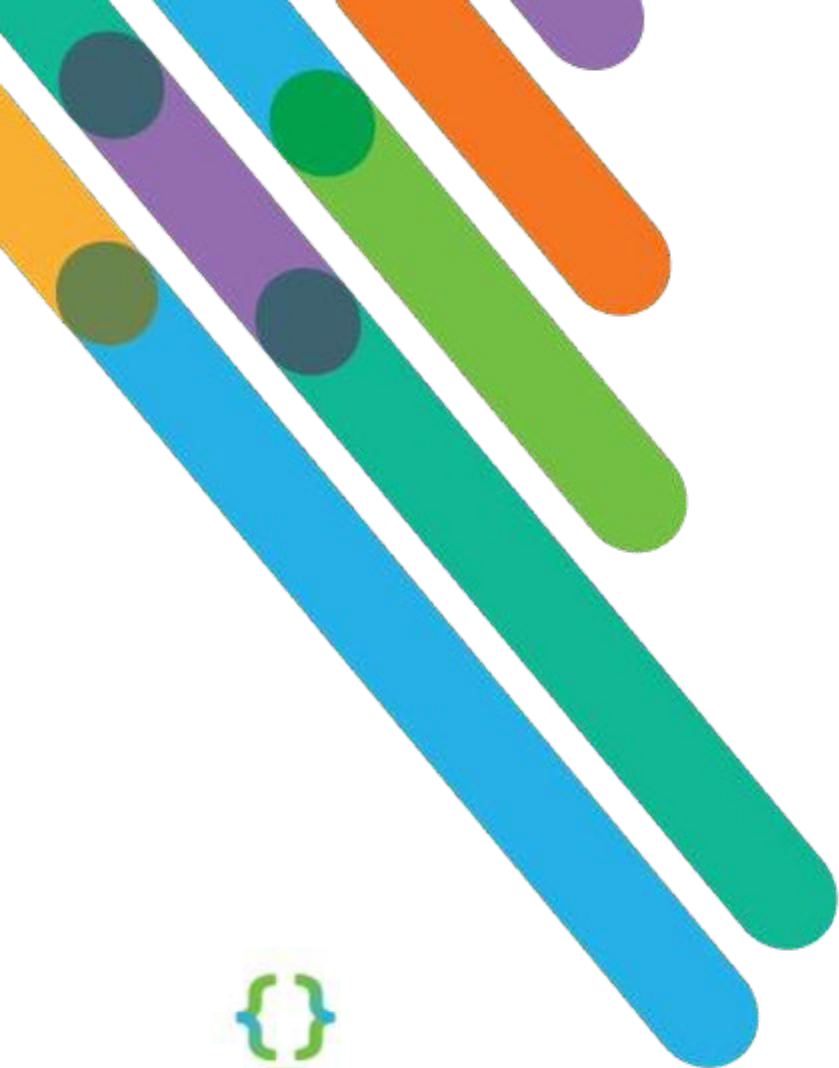
Append filters to the embed code (URL) to pass context. For Power BI the format is:

&filter=TableName/FieldName eq '@@PAGECONTEXTRECORDID@'

TableName/FieldName is the Power BI Query table and field

[Power BI embed URL structure](#)





Maintain Report

PUBLISH TO POWER BI SERVICE AND MAINTAIN DATA SOURCE CONNECTION THROUGH DATA GATEWAY



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What is a Data Gateway?

A Data Gateway supports the online refreshes of the imported datasets on Power BI.

A Data Gateway is required to connect Power BI Service to an on-premise SQL Server or any time it is necessary to store a centralized set of credentials for the scheduled refresh.

The user requesting data from CRM is the Power BI Service, not an individual viewing the report. A Data Gateway manages the CRM access credentials.

Installing Power BI Data Gateway

Download “standard mode” from
Microsoft’s page:

<https://powerbi.microsoft.com/en-us/gateway/>

Where to install:

- Client’s Azure or on-prem location
- Read-only requires whitelisted IP for gateway
- Must be online/accessible during scheduled dataset refreshes

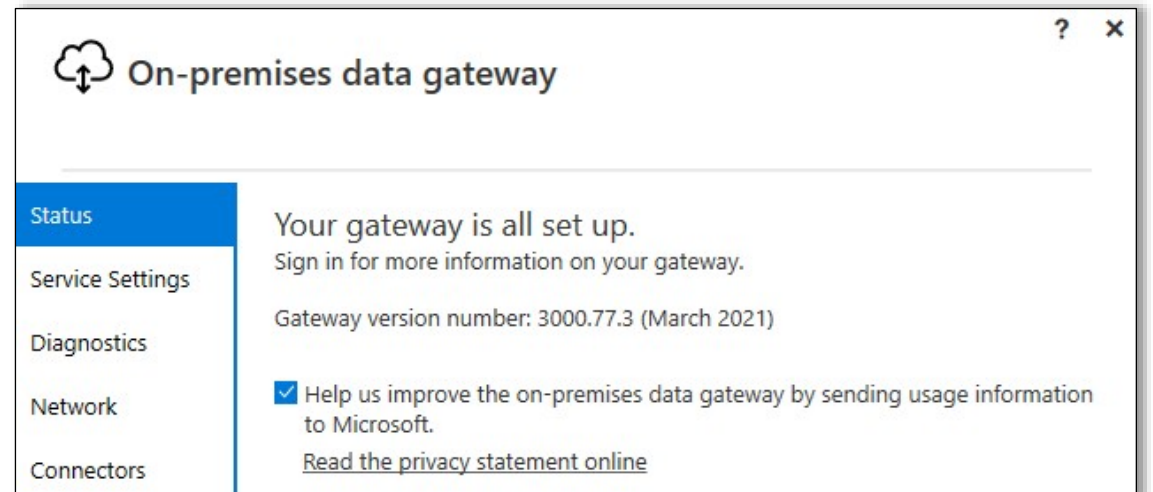
Connect to on-premises data sources with a Power BI gateway

Keep your dashboards and reports up to date by connecting to your on-premises data sources without the need to move the data. Query large datasets and take advantage of your existing investments. Get the flexibility you need to meet individual needs, and the needs of your organization.

Download standard mode >

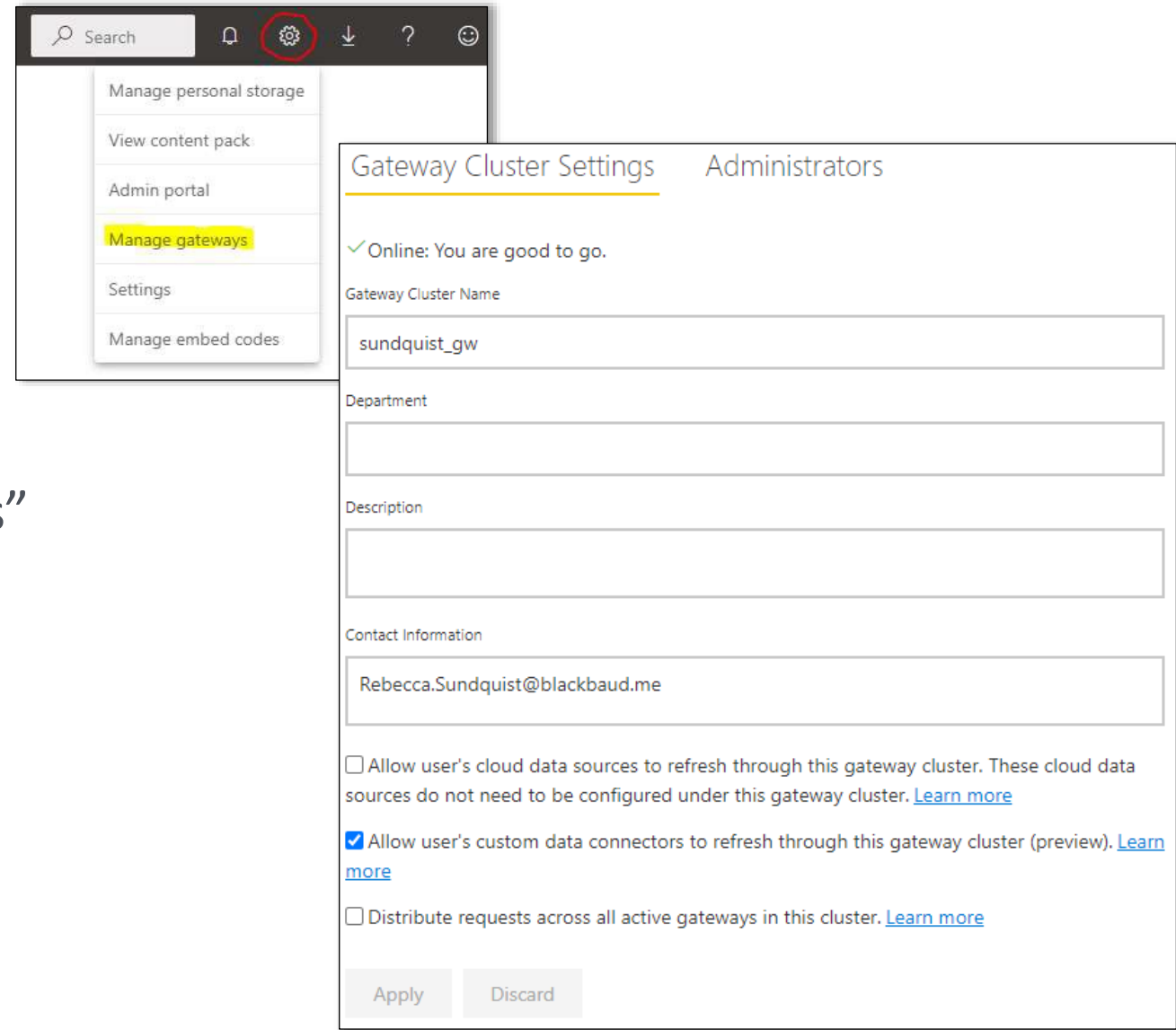
Download personal mode >

[Learn more >](#)



The screenshot shows the 'On-premises data gateway' status page. The title bar includes a cloud icon with a downward arrow and the text 'On-premises data gateway'. A left-hand navigation menu lists: Status (highlighted in blue), Service Settings, Diagnostics, Network, and Connectors. The main content area displays: 'Your gateway is all set up. Sign in for more information on your gateway. Gateway version number: 3000.77.3 (March 2021)'. Below this is a checked checkbox for 'Help us improve the on-premises data gateway by sending usage information to Microsoft.' with a link to 'Read the privacy statement online'.

Configuring Power BI Data Gateway



The image shows a screenshot of the Power BI Service interface. On the left, the Settings wheel is open, with the gear icon circled in red. The 'Manage gateways' option is highlighted in yellow. On the right, the 'Gateway Cluster Settings' form is displayed, showing the following fields and options:

- Gateway Cluster Name:** sundquist_gw
- Department:** (empty text box)
- Description:** (empty text box)
- Contact Information:** Rebecca.Sundquist@blackbaud.me
- Allow user's cloud data sources to refresh through this gateway cluster. These cloud data sources do not need to be configured under this gateway cluster. [Learn more](#)
- Allow user's custom data connectors to refresh through this gateway cluster (preview). [Learn more](#)
- Distribute requests across all active gateways in this cluster. [Learn more](#)

At the bottom of the form are 'Apply' and 'Discard' buttons.

From the Settings wheel in the Power BI Service tool bar, select “Manage Gateways”

Define

1. Gateway Cluster Settings
2. Administrators

Add a data source to Power BI Data Gateway

Click “Add Data Source”

OR expand the gateway to view data sources already created

Define

1. Data Source Settings

Always “Skip Test Connection”

2. Users: define who can publish reports that use this data source

ADD DATA SOURCE

GATEWAY CLUSTERS

- sundquist_gw
 - HeDemo BBDW
 - odata - Revenue basic example
 - odata - Fundraiser Analysis
 - HeDemo OLTP**
 - odata - Campaign Goals + Revenue Ro...

Test all connections

Data Source Settings Users

✓ Connection Successful

Data Source Name: HeDemo OLTP

Data Source Type: SQL Server

Server: s26readonlyaccess.sky.blackbaud.com,50101

Database: 5740hedemo

Authentication Method: Basic

The credentials are encrypted using the key stored on-premises on the gateway server. [Learn more](#)

Username:

Password:

Skip Test Connection

> Advanced settings

Apply Discard

Gateway Connection for Report Dataset

Navigate to “Settings” for the dataset uploaded from .pbix

1. Turn on “Use a data gateway or Vnet”
2. Select the Gateway
3. Select the data source that you previously configured under the gateway in the “Maps to:” drop down.

“Settings” is also where you schedule the refresh

Settings for HEDemo_ReadOnly_OLTP_referencing_query_views

Last refresh succeeded: Mon Mar 29 2021 14:07:23 GMT-0500 (Central Daylight Time)
Next refresh: Mon Apr 05 2021 05:00:00 GMT-0500 (Central Daylight Time)
[Refresh history](#)

Gateway connection

To use a data gateway, make sure the computer is online and the data source is added in [Manage Gateways](#). If you're using an On-premises data gateway (standard mode), please select the corresponding data sources and then click apply.

Use a data gateway or VNet On

Gateway	Department	Contact information	Status	Actions
sundquist_gw		Rebecca.Sundquist@bl...	Running on chs6rebeccsun01	

Data sources included in this dataset:

SqlServer{"server":"s26readonlyaccess.sky.blackbaud.com,50101","database":"5740hedemo"}	Maps to: HeDemo OLTP
---	-------------------------

- Data source credentials
- Parameters
- Scheduled refresh
- Q&A
- Featured Q&A questions
- Endorsement
- Dataset Image

Only users defined with the data source can add the gateway's data source to a dataset.

[Microsoft Learn: Power BI](#)

[Power BI Licenses Explained](#)

[Power BI Gateway](#)

[Blackbaud Infinity Technical Reference](#)

[Blackbaud Community Developer Discussions](#)



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Thank you!