

LEVERAGING POWER BI WITH DYNAMICS 365 CUSTOMER ENGAGEMENT



Joe Griffin

 <https://crmchap.co.uk>

 joe@griffin.gb.net

 joejgriffin

 joejgriffin

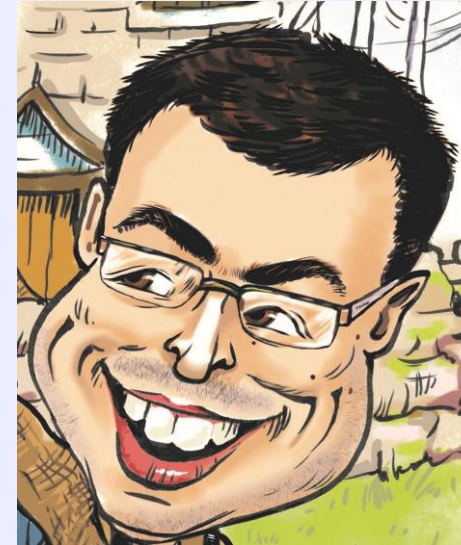
 JJGriffin

AGENDA

- **About Me**
- **Dynamics 365 Customer Engagement (“CRM”) Background**
 - Application History
 - Brief Overview of Built-in Reporting Options
- **Using Power BI with CRM**
 - Licensing Considerations
 - Power BI Online
 - Apps for Power BI
 - Data flows
 - Power BI Desktop
 - Dynamics 365 Connector
 - Common Data Service Connector
 - FetchXML
 - SQL (on-premise or Azure SQL via Data Export Service)
- **Closing Remarks**

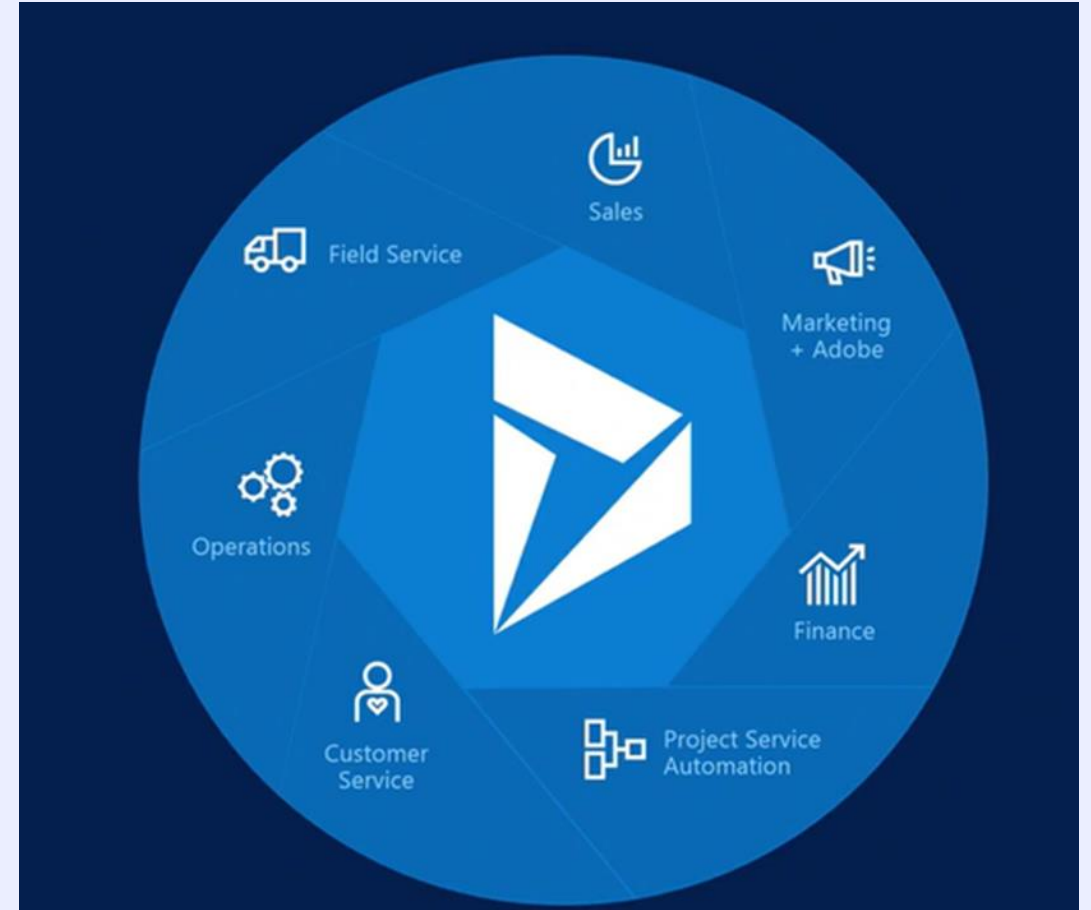
ABOUT ME

- Director @ SOLO Cloud Solutions
- MCSA Dynamics 365 & BI Reporting, MCSE Business Applications & Data Management and Analytics, Dynamics 365 Sales Functional Consultant Associate
- Worked with CRM/D365 for around 4 years; previous background of SQL, C#, Office 365; currently involved as technical architect for a solution for the UK water industry, built using Power BI and Azure
- PRINCE2 PM/Agile Practitioner
- Certified Scrum Master (Scrum Alliance)
- CRMUG/D365UG NW Committee Member

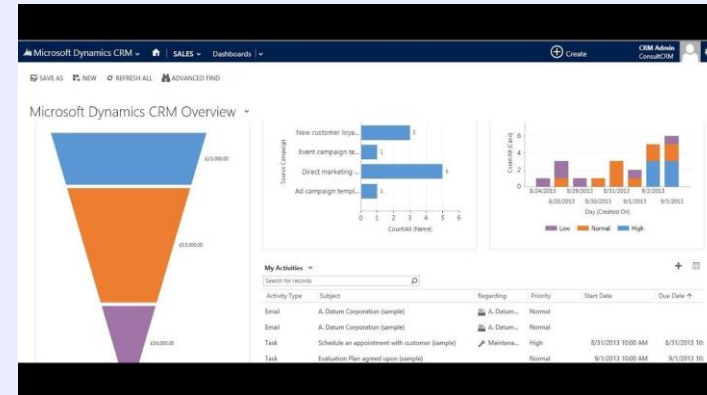


DYNAMICS 365 CUSTOMER ENGAGEMENT OVERVIEW

- Previously known as Dynamics CRM, a “Customer Relationship Management” application developed by Microsoft.
- 16+ year history
- “Modular” system, enabling organisations to:
 - Manage sales qualification processes
 - Provide full case management functionality to customers
 - Integrates with external features, such as Portals, Voice of the Customer, Office 365, Exchange Server etc.
 - Customise the application extensively, either within the interface or via code.
 - And more!
- Cloud based with on-premise version available

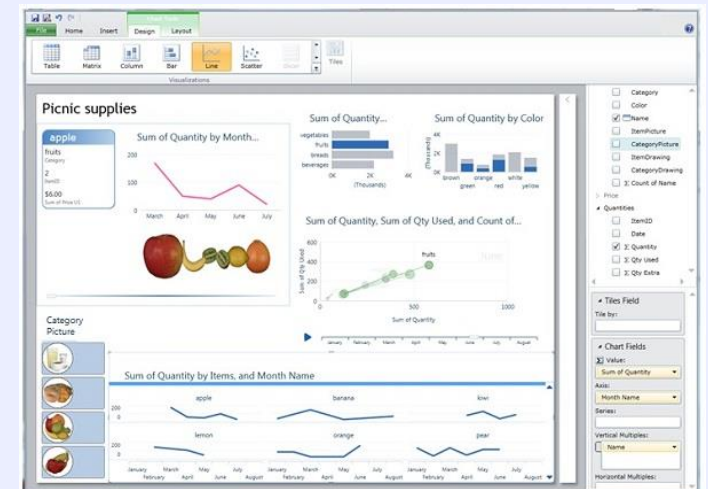


A LONG TIME AGO...

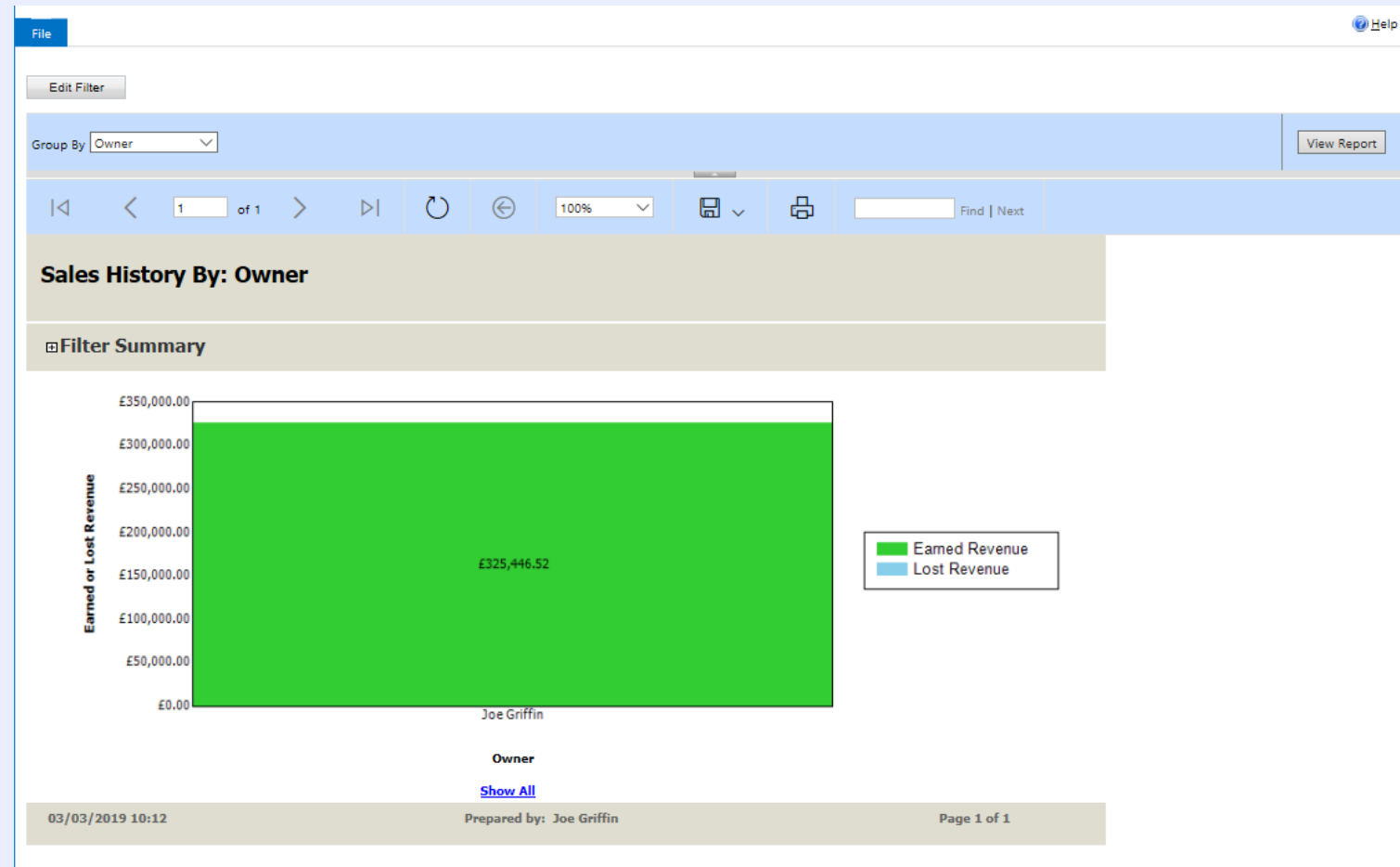
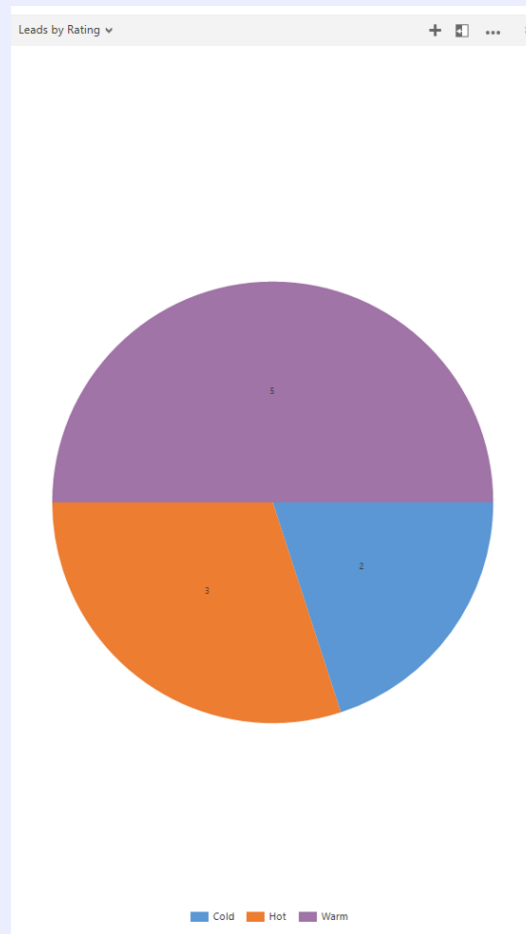


Dynamics
CRM 2013

Project
Crescent



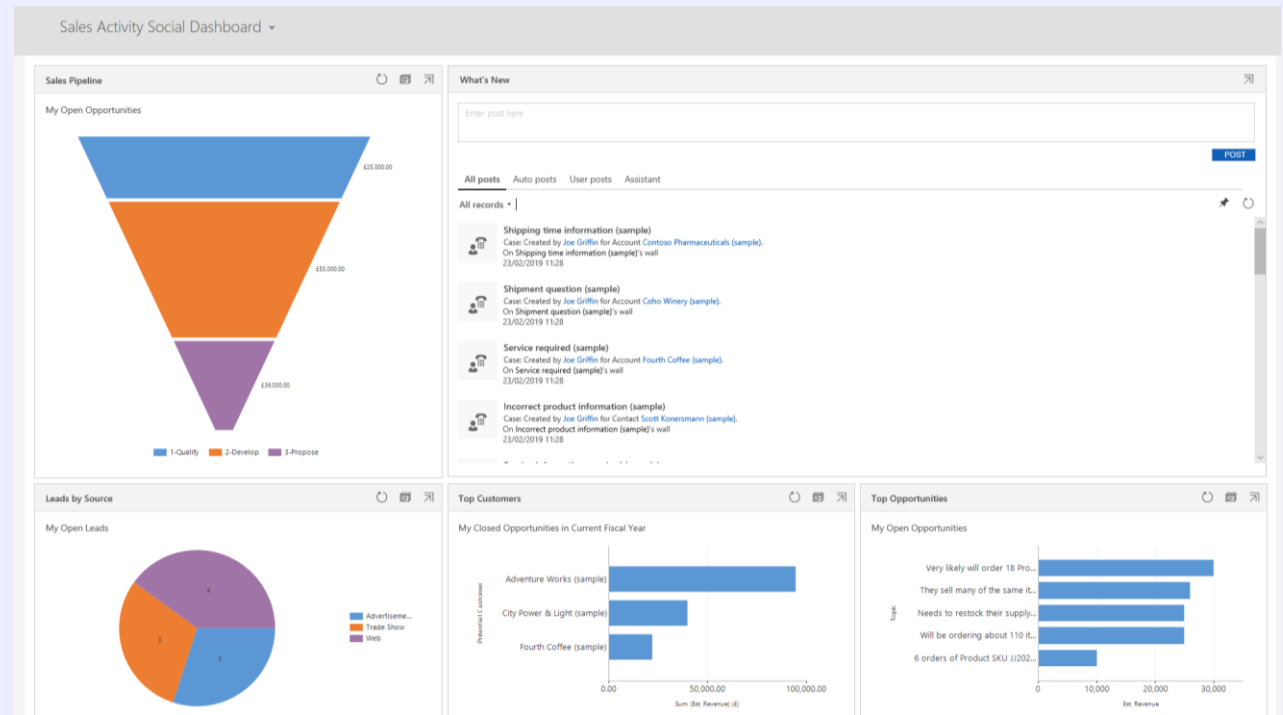
DYNAMICS CRM 2013 REPORTING OPTIONS



DYNAMICS CRM 2013 REPORTING OPTIONS

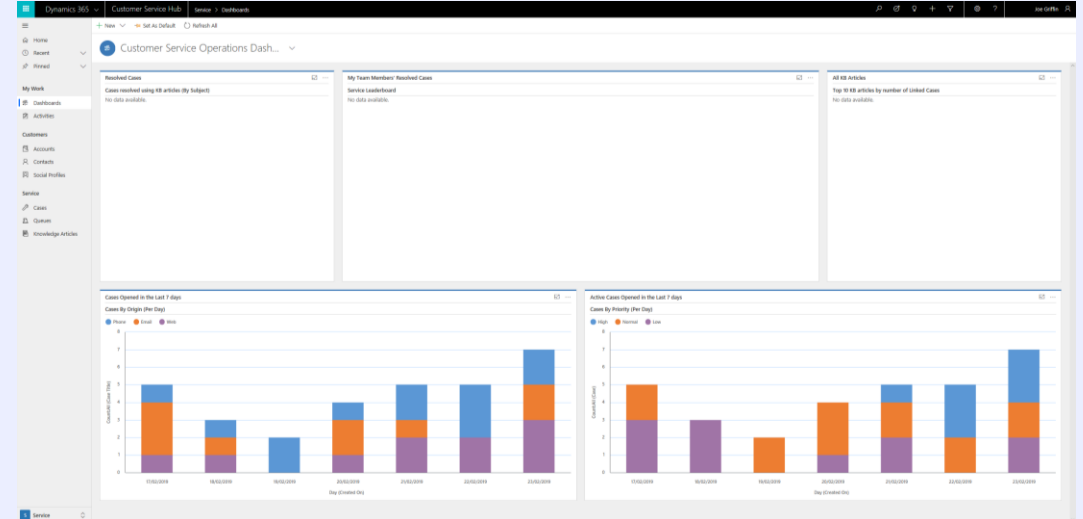
My Active Contacts ▾

Full Name ↑	Email	Company Name	Business Phone
Dave Chapelle	joe@domain.com		
Jim Glynn (sample)	someone_j@example....	Coho Winery (sample)	555-0109
Joe Griffin	Joejgriffin@me.com		
Joe Joe	joe@domain.com		
Maria Campbell (sample)	someone_d@example....	Fabrikam, Inc. (sample)	555-0103
Nancy Anderson (sample)	someone_c@example....	Adventure Works (sa...	555-0102
Patrick Sands (sample)	someone_k@example....	Alpine Ski House (sam...	555-0110
Paul Cannon (sample)	someone_h@example....	Alpine Ski House (sam...	555-0107
Rene Valdes (sample)	someone_i@example....	A. Datum Corporation...	555-0108
Robert Lyon (sample)	someone_g@example....	Contoso Pharmaceutic...	555-0106
Scott Konersmann (sample)	someone_f@example....	City Power & Light (sa...	555-0105
Sidney Higa (sample)	someone_e@example....	Blue Yonder Airlines (s...	555-0104
Susan Burk (sample)	someone_l@example....	A. Datum Corporation...	555-0111
Susanna Stubberod (sample)	someone_b@example....	Litware, Inc. (sample)	555-0101
Test			
Test			
Thomas Andersen (sample)	someone_m@exampl...	Coho Winery (sample)	555-0112
Yvonne McKay (sample)	someone_a@example....	Fourth Coffee (sample)	555-0100



ANYONE using the application can create these

FAST FORWARD TO TODAY



Dynamics 365 Customer Engagement



REPORTING IN DYNAMICS 365 CUSTOMER ENGAGEMENT

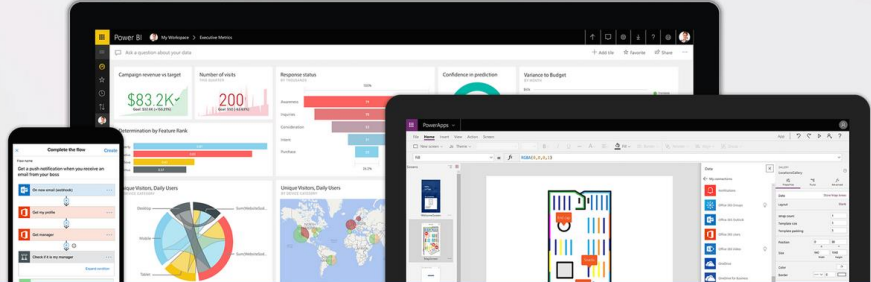


Which leaves a fairly obvious question...how does Power BI fit in?

INTRODUCING THE POWER PLATFORM


Customise, extend, and build all the apps you need with the Microsoft Power Platform

Unlock the potential of Dynamics 365 and Office 365 faster than you ever thought possible.




Empower everyone to innovate with one connected app platform

Creating apps for your business just got easier. A powerful, point-and-click approach to app building makes it easy for anyone familiar with Microsoft Office to customise and extend Dynamics 365 and Office 365 and build a new category of apps.




PowerApps

Build apps in hours—not months—that easily connect to data, use Excel-like expressions to add logic, and run on the web, iOS, and Android devices



Power BI

Make sense of your data through interactive, real-time dashboards and unlock the insights needed to drive your business forward.



Microsoft Flow

Include powerful workflow automation directly in your apps with a no-code approach that connects to hundreds of popular apps and services.

- CRM is now, in effect, a PowerApp.
- CRM Database = Common Data Service Database
- CRM customisation experience gradually migrating across to PowerApps
- Microsoft are clearly signposting Power BI as their preferred platform for reporting within the wider stack

SO WHERE DOES THIS LEAVE US?

- D365CE has numerous existing reporting options available, which can cover most business requirements...
- ...however, most of these have a “legacy” feel and appear to be out of step with the Power Platform.
- SSRS overcomplicates the technical architecture of CRM within the Power Platform
- Familiarity with Power BI now becomes mandatory when building out an effective business applications solution, especially if there is a requirement to integrate with external systems.
 - The flipside of this is that Power BI Developers must also start becoming familiar with Power Apps and Flow.

A MINEFIELD OF OPTIONS

- Difficulties can arise when determining the best way to generate reporting information from D365CE and how to align these to business requirements:
 - Does data need to be refreshed instantly or on schedule?
 - Are you querying just CRM data or do you need to bring in other application data?
 - What's the "state" of your data?
 - What are technical capabilities within your team/organisation?
 - How big is your wallet? (Most important question 😁)
- Answering these questions will help you determine how a Power BI solution can fit in alongside D365CE

GETTING STARTED WITH POWER BI AND DYNAMICS 365 CUSTOMER ENGAGEMENT

LICENSING NOTES

- Power BI is **NOT** an included SKU as part of the current Dynamics 365 Customer Engagement offers.
- User must be assigned a Free or Professional License to access and deploy reports to the online service OR part of a Workspace assigned to a Premium capacity.
- Keep in mind the limitations around the Free SKU:
 - No internal/external sharing
 - No scheduling
 - Apps cannot be installed
 - Dataset size/refresh limitations

POWER BI ONLINE

POWER BI APPS

OVERVIEW

Pre-built Dashboard/Reports from Microsoft that expose key information from the Sales, Service and Voice of the Customer Modules. Available on AppSource

- + Quick and easy to deploy.
- + Exposes broad variety of “out of the box” functionality.
- + No Power BI development experience required.
- Power BI Professional License Required
- No ability to modify or expose bespoke CRM customization's
- US-centric from a reporting standpoint

VERDICT


Useful for early-stage demonstrations or planning sessions to identify bespoke reporting requirements; for smaller organization's, potentially “good to go” as a solution.




Microsoft Dynamics 365 Process Analyzer
By Microsoft
Power BI apps
See the performance and throughput of your business processes by volume and

★★★★★ (11)

Free


[Get it now](#) 




Customer Service Analytics for Dynamics 365
By Microsoft
Power BI apps
Get insights about your customer service performance, activities and active cases

★★★★★ (39)

Free


[Get it now](#) 

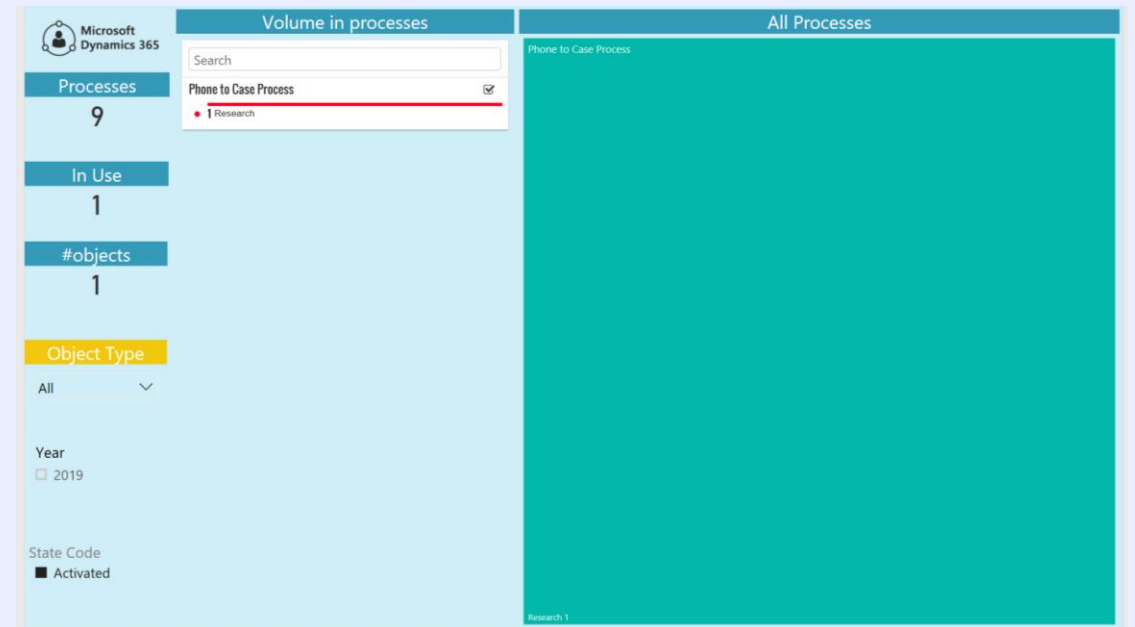
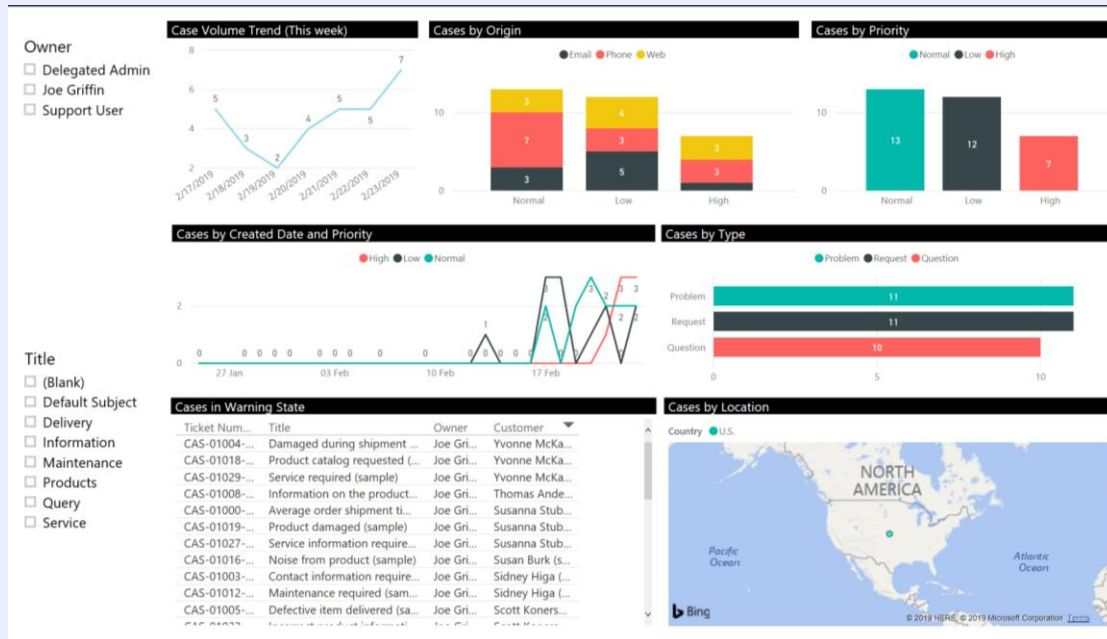


Sales Analytics for Dynamics 365
By Microsoft
Power BI apps
Explore your past sales performance, activities, sales pipeline and more

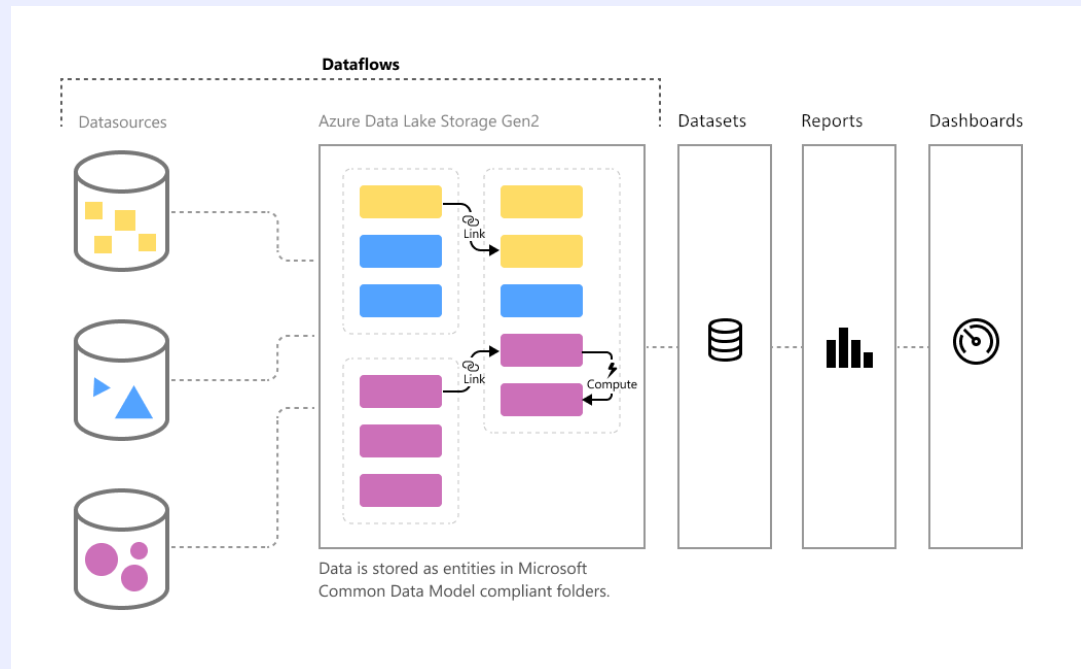
★★★★★ (91)

Free

[Get it now](#) 



DATA FLOWS



OVERVIEW

Using the Common Data Service for Apps connector, D365CE entities can be brought into a dataflow to centralise, combine and manipulate data for further consumption

- + Uses a fully supported connector, allowing you to quickly bring in data from the application.

- + Exposes all system/custom entities that the connecting user has access to.

- + Allows you to bring all connections to CRM within a single location.

- Requires considerable work in Power Query to create consolidated/focused queries.


- Some familiarity with CRM data structure is required.

- Requires Power BI Professional / Premium Capacity

VERDICT

Lots of potential here to help with consolidating datasets across a Power BI Online tenant, but considerable Power Query knowledge required to get the CRM data into the best format for end-user consumption



PREVIOUSLY IN PREVIEW, DATA FLOWS ARE NOW...

 Microsoft | **Power BI** | Products | Pricing | Solutions | Partners | Learn | Com

Microsoft Power BI Blog

BLOG > ANNOUNCEMENTS > FEATURES > POWER BI

Announcing Power BI dataflows general availability

 **Anton Fritz**  April 2, 2019

[In](#) [Share](#) [Tweet](#) [Like](#)

Several months ago, we introduced Power BI dataflows as [Public Preview](#). Now, we're happy to announce that Power BI dataflows are generally available!

[Power BI dataflows](#) provide business analysts with a self-service data prep and management experience within Power BI, allowing them to collect business [data from various sources](#), clean and transform it — leveraging the familiar Power Query experience and the [Common Data Model](#) and land it into Power BI storage, making it available for reuse by multiple Power BI datasets.

Additionally, Power BI Premium customers can leverage dataflows workload to enjoy additional functionality including dataflow [time-based Incremental refresh](#) for faster refresh time than full refresh, [Computed entities](#) for transformations on data in storage, and [Linked entities](#) which allow users to create reusable ETL logic, powered by our new recalculation engine which automatically tracks dependencies and recomputes data as new data is ingested. Admins can obtain visibility into dataflows health metrics and KPIs using Premium Capacity Metrics app.

Rob Long, Director of Software Development at Fiserv, recently shared with us that "Data analysts were spending most of their time attempting to locate the proper data, rather than performing analysis on it. Using dataflows has shortened the learning curve and development timeline for data analysts to provide insights to answer business questions. Through the use of common data elements across dataflows, associates are now able to connect and reference systems that were previously extremely difficult and labor intensive."

...generally available!!



Choose data source

All categories File Database Azure Online services Other

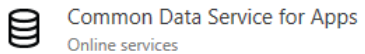
Search

Data sources

Access File	Excel File	JSON File	Text/CSV File	XML File	Amazon Redshift Database	IBM Db2 database Database
MySQL database Database	Oracle database Database	PostgreSQL database Database	SQL Server database Database	Sybase database Database	Teradata database Database	Vertica Database
Azure Blobs Azure	Azure Data Explorer Azure	Azure SQL Data Warehouse Azure	Azure SQL database Azure	Azure Tables Azure	Common Data Service for Apps Online services	Microsoft Exchange Online Online services
Salesforce objects Online services	Salesforce reports Online services	SharePoint Online list Online services	Smartsheet Online services	Active Directory Other	OData Other	SharePoint list Other
Web API Other	Web page Other	Blank table Other	Blank query Other			



Connect to data source



Connection settings

Server Url *

Connection credentials

On-premises data gateway

(none)

Authentication kind

Organizational account

You are currently signed in.

[Sign in as different user](#)

Common Data Service for Apps [2]

Entities [152]

- ☒ Account
- ☐ AccountLeads
- ☐ ActivityMimeAttachment
- ☐ ActivityParty
- ☒ ActivityPointer
- ☐ adminsettingsentity
- ☐ Annotation
- ☐ Appointment
- ☐ Attachment
- ☐ BookableResource
- ☐ BookableResourceBooking
- ☐ BookableResourceBookingHeader
- ☐ BookableResourceCategory
- ☐ BookableResourceCategoryAssn
- ☐ BookableResourceCharacteristic
- ☐ BookableResourceGroup
- ☐ BookingStatus

DEMO

POWER BI DESKTOP

DYNAMICS 365 CONNECTOR

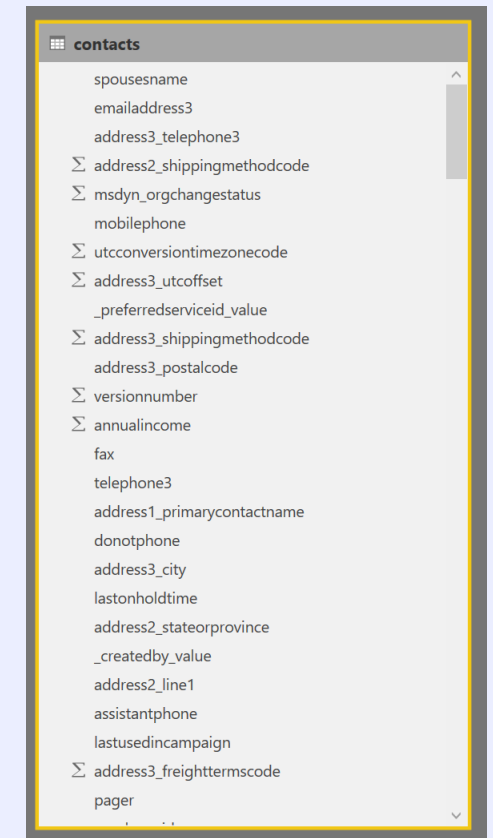
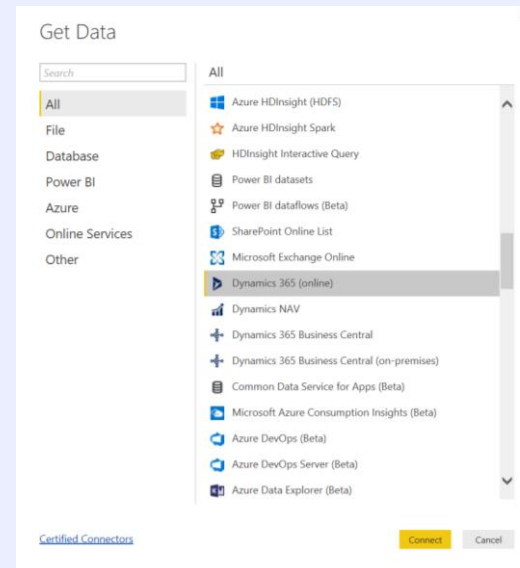
OVERVIEW

OData connector for Dynamics 365 Customer Engagement within Power BI Desktop.

- + Uses a fully supported connector, allowing you to quickly bring in data from the application.
- + Exposes *a//system/custom* entities that the connecting user has access to.
- + Power BI Professional not required.
- Does not return labels for record ID's, lookups, option sets and Status/Status Reason values.
- Requires considerable work in Power Query to create consolidated/focused queries.
- Some familiarity with CRM data structure is required.

VERDICT

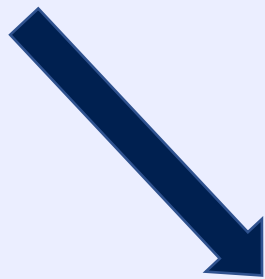
Provides a streamlined route for report developers to connect to CRM, but familiarity with OData and inner quirks of CRM is required to successfully present data that can be consumed by end users.



_createdby_value	statecode	statuscode	firstname	lastname	gendercode
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d5621c9b-989c-4d0c-8bf9-093dcd6246f1	0	1	Nancy	Anderson (sample)	2
d5621c9b-989c-4d0c-8bf9-093dcd6246f1	0	1	Susan	Burk (sample)	2
d5621c9b-989c-4d0c-8bf9-093dcd6246f1	0	1	Maria	Campbell (sample)	2
d5621c9b-989c-4d0c-8bf9-093dcd6246f1	0	1	Paul	Cannon (sample)	1
d5621c9b-989c-4d0c-8bf9-093dcd6246f1	0	1	Dave	Chapelle	
d5621c9b-989c-4d0c-8bf9-093dcd6246f1	0	1	Jim	Glynn (sample)	1
d5621c9b-989c-4d0c-8bf9-093dcd6246f1	0	1	Joe	Griffin	
d5621c9b-989c-4d0c-8bf9-093dcd6246f1	0	1	Sidney	Higa (sample)	1
d5621c9b-989c-4d0c-8bf9-093dcd6246f1	0	1	Joe	Joe	
d5621c9b-989c-4d0c-8bf9-093dcd6246f1	0	1	Scott	Konersmann (sample)	1
d5621c9b-989c-4d0c-8bf9-093dcd6246f1	0	1	Robert	Lyon (sample)	1
d5621c9b-989c-4d0c-8bf9-093dcd6246f1	0	1	Yvonne	McKay (sample)	2
d5621c9b-989c-4d0c-8bf9-093dcd6246f1	0	1	Patrick	Sands (sample)	1
d5621c9b-989c-4d0c-8bf9-093dcd6246f1	0	1	Susanna	Stubberod (sample)	2
d5621c9b-989c-4d0c-8bf9-093dcd6246f1	0	1	Test		
d5621c9b-989c-4d0c-8bf9-093dcd6246f1	0	1	Rene	Valdes (sample)	2



```
let
    null,
    [Implementation="2.0"
    Head
    Signature="table"]][Data]
in
    contacts_table
```



systemusers	contacts
ownerid	spousesname
title	emailaddress3
organizationid	address3_telephone3
nickname	Σ address2_shippingmethodcode
defaulttofoldername	Σ address3_shippingmethodcode
address1_stateorprovince	Σ medyn_orgchangelstatus
applicationid	mobilephone
address1_upszone	Σ utconversiontimezonecode
lastname	Σ address3_utcoffset
Σ address1_latitude	Σ preferredserviceid_value
Σ address1_shippingmethodcode	Σ address3_shippingmethodcode
Σ address1_utcoffset	address3_postalcode
Σ createdonbehalfby_value	Σ versionnumber
homephone	Σ annualincome
Σ address2_latitude	fax
governmentid	telephone3
salutation	address1_primarycontactname
Σ address2_longitude	donotphone
Σ versionnumber	address3_city
address2_fax	lastonholdtime
	address2_stateorprovince
	Σ _createdby_value
	address2_line1
	assistantphone
	lastusedincampaign
	Σ address3_freighttermcode
	pager



1 CreatedBy = RELATED(systemusers[fullname])

Modify List Value

Modify this list value's label.

Label*

Value

Color

OK Cancel

Add Conditional Column

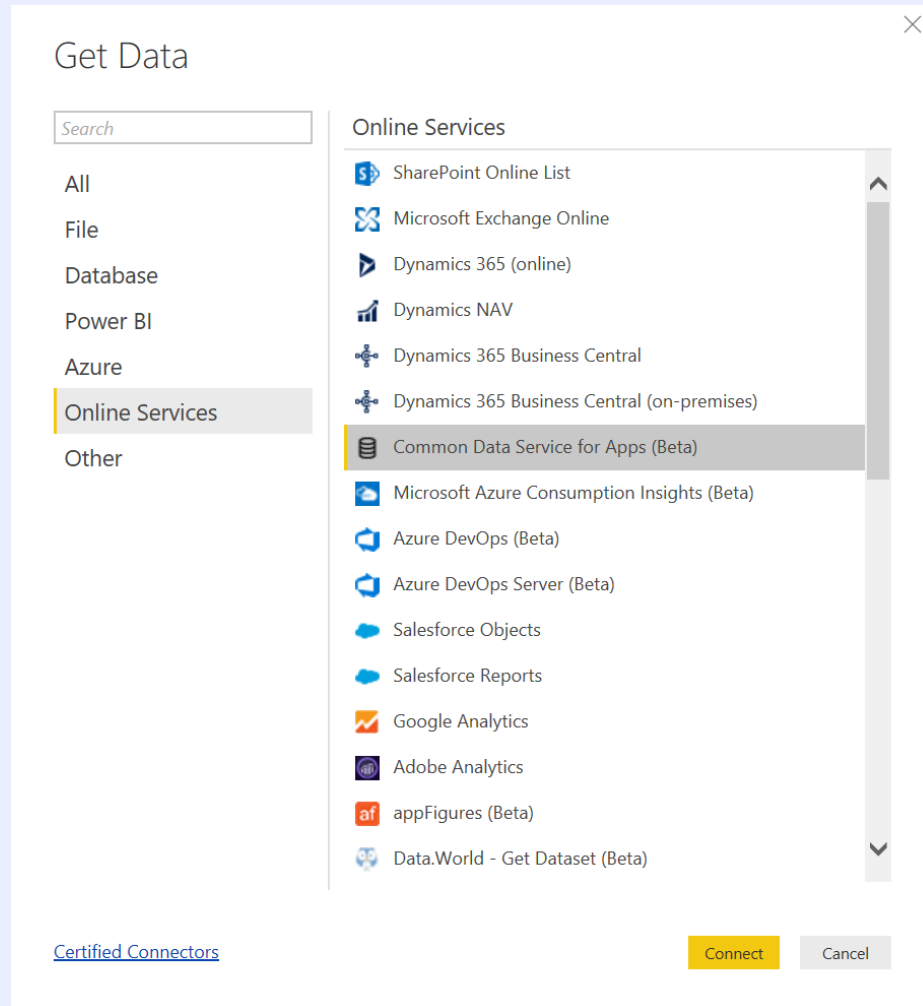
Add a conditional column that is computed from the other columns or values.

New column name

	Column Name	Operator	Value	Then	Output
If	statuscode	equals	0	Then	Inactive
Else If	statuscode	equals	1	Then	Active
Otherwise					NULL

OK Cancel

COMMON DATA SERVICE FOR APPS CONNECTOR



OVERVIEW

New connector for the Common Data Service for Apps Web API (i.e. the Dynamics 365 Customer Engagement OData endpoint).

+ Quick and easy to deploy.

+ Options to re-order columns alphabetically and include formatted values automatically.

+ Power BI Professional not required.

+ Exposes other CDS data, not just CRM , and also CRM functions.

- Does not return labels for record ID's and lookups,

VERDICT

Fixes many of the glaring issues with the Dynamics 365 Connector and now represents the natural choice for report developers to quickly bring in data from the application.

Common Data Service for Apps

Server Url

https://jig.crm11.dynamics.com

Advanced settings (optional)

Reorder columns (optional)

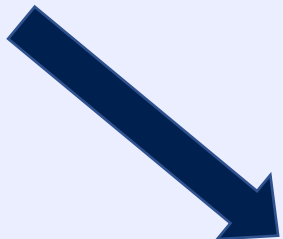
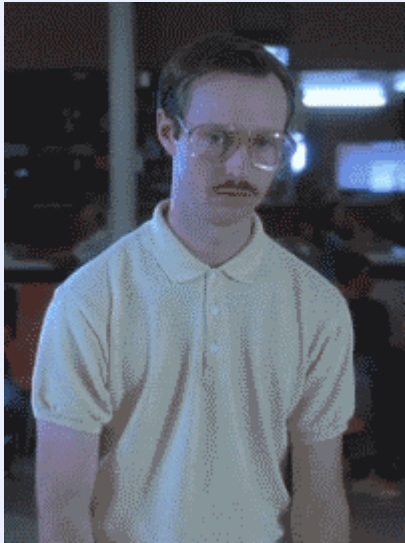
true

Add display column (optional)

true

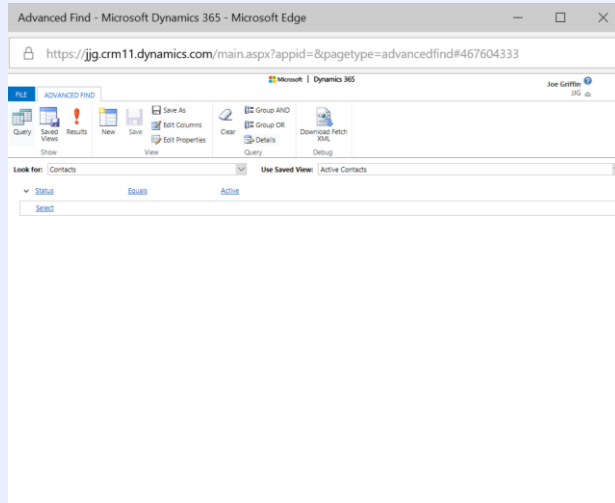
OK

Cancel



createdby	statecode	statecode_display	statuscode	statuscode_display	firstname	lastname	gendercode	gendercode_display
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d5621c9b-989c-4d0c-8bf9-093dcd6246f1	0	Active	1	Active	Dave	Chapelle		
d5621c9b-989c-4d0c-8bf9-093dcd6246f1	0	Active	1	Active	Jim	Glynn (sample)	1	Male
d5621c9b-989c-4d0c-8bf9-093dcd6246f1	0	Active	1	Active	Joe	Griffin		
d5621c9b-989c-4d0c-8bf9-093dcd6246f1	0	Active	1	Active	Joe	Joe		
d5621c9b-989c-4d0c-8bf9-093dcd6246f1	0	Active	1	Active	Maria	Campbell (sample)	2	Female
d5621c9b-989c-4d0c-8bf9-093dcd6246f1	0	Active	1	Active	Nancy	Anderson (sample)	2	Female
d5621c9b-989c-4d0c-8bf9-093dcd6246f1	0	Active	1	Active	Patrick	Sands (sample)	1	Male
d5621c9b-989c-4d0c-8bf9-093dcd6246f1	0	Active	1	Active	Paul	Cannon (sample)	1	Male
d5621c9b-989c-4d0c-8bf9-093dcd6246f1	0	Active	1	Active	Rene	Valdes (sample)	2	Female
d5621c9b-989c-4d0c-8bf9-093dcd6246f1	0	Active	1	Active	Robert	Lyon (sample)	1	Male
d5621c9b-989c-4d0c-8bf9-093dcd6246f1	0	Active	1	Active	Scott	Konersmann (sample)	1	Male
d5621c9b-989c-4d0c-8bf9-093dcd6246f1	0	Active	1	Active	Sidney	Higa (sample)	1	Male
d5621c9b-989c-4d0c-8bf9-093dcd6246f1	0	Active	1	Active	Susan	Burk (sample)	2	Female
d5621c9b-989c-4d0c-8bf9-093dcd6246f1	0	Active	1	Active	Susanna	Stubberod (sample)	2	Female
d5621c9b-989c-4d0c-8bf9-093dcd6246f1	0	Active	1	Active	Thomas	Andersen (sample)	1	Male
d5621c9b-989c-4d0c-8bf9-093dcd6246f1	0	Active	1	Active	Yvonne	McKay (sample)	2	Female

FETCHXML QUERIES VIA THE ODATA ENDPOINT



@odata.etag	fullname	emailaddress1	contactid
W/"998263"	Dave Chapelle	joe@domain.com	9d93561a-451f-e911-a96d-002248014cda
W/"1831644"	Jim Glynn (sample)	someone_j@example.com	1a04afdc-5d37-e911-a97c-0022480749f0
W/"1243387"	Joe Griffin	Joejgriffin@me.com	683c4b48-3723-e911-a96d-002248014cda
W/"998257"	Joe Joe	joe@domain.com	ec40c3f0-441f-e911-a96d-002248014cda
W/"1831602"	Maria Campbell (sample)	someone_d@example.com	0e04afdc-5d37-e911-a97c-0022480749f0
W/"1831595"	Nancy Anderson (sample)	someone_c@example.com	0c04afdc-5d37-e911-a97c-0022480749f0
W/"1831653"	Patrick Sands (sample)	someone_k@example.com	1c04afdc-5d37-e911-a97c-0022480749f0
W/"1831630"	Paul Cannon (sample)	someone_h@example.com	1604afdc-5d37-e911-a97c-0022480749f0
W/"1831637"	Rene Valdes (sample)	someone_i@example.com	1804afdc-5d37-e911-a97c-0022480749f0
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W/"1831616"	Scott Konersmann (sample)	someone_f@example.com	1204afdc-5d37-e911-a97c-0022480749f0
W/"1831609"	Sidney Higa (sample)	someone_e@example.com	1004afdc-5d37-e911-a97c-0022480749f0
W/"1831660"	Susan Burk (sample)	someone_l@example.com	1e04afdc-5d37-e911-a97c-0022480749f0
W/"1831588"	Susanna Stubberod (sample)	someone_b@example.com	0a04afdc-5d37-e911-a97c-0022480749f0
W/"998129"	Test		b10977d7-7b1e-e911-a970-0022480130e2
W/"998063"	Test		2525972a-751e-e911-a971-0022480140fe
W/"1831667"	Thomas Andersen (sample)	someone_m@example.com	2004afdc-5d37-e911-a97c-0022480749f0
W/"1831581"	Yvonne McKay (sample)	someone_a@example.com	0804afdc-5d37-e911-a97c-0022480749f0

OVERVIEW

By using the OData endpoint, it is possible to execute FetchXML queries to return data back into Power BI.

- + Full FetchXML functionality can be used (filtering, joins etc.)
- + Can re-use existing view/Report queries.
- + Allows you to specify whether option set, user name etc. labels are returned or not.
- Requires some knowledge of M to implement
- Only useful if you have someone who is familiar with compiling FetchXML queries.
- Can cause performance issues when scaled.

VERDICT

Complex way to bring in data but allows for those who are familiar with building FetchXML queries to pass these onto BI Developers, without them needing to become overtly familiar with the application.

```
FetchXML.xml
1 <fetch mapping="logical" output-format="xml-platform" version="1.0" distinct="false">
2   <entity name="contact">
3     <attribute name="fullname" />
4     <attribute name="parentcustomerid" />
5     <attribute name="telephone1" />
6     <attribute name="emailaddress1" />
7     <attribute name="contactid" />
8     <order descending="false" attribute="fullname" />
9     <filter type="and">
10       <condition attribute="ownerid" operator="eq-userid" />
11       <condition value="0" attribute="statecode" operator="eq" />
12     </filter>
13   </entity>
14 </fetch>
```

Enter Parameters

crmURL

Example: abc

entityName

Example: abc

query

Example: abc

Invoke

Clear

function (crmURL as text, entityName as text, query as text) as any



	ABC 123 @odata.etag	ABC 123 fullname	ABC 123 emailaddress1	ABC 123 contactid
1	W/"998263"	Dave Chapelle	joe@domain.com	9d93561a-451f-e911-a96d-002248014cda
2	W/"1831644"	Jim Glynn (sample)	someone_j@example.com	1a04afdc-5d37-e911-a97c-0022480749f0
3	W/"1243387"	Joe Griffin	Joejgriffin@me.com	683c4b48-3723-e911-a96d-002248014cda
4	W/"998257"	Joe Joe	joe@domain.com	ec40c3f0-441f-e911-a96d-002248014cda
5	W/"1831602"	Maria Campbell (sample)	someone_d@example.co...	0e04afdc-5d37-e911-a97c-0022480749f0
6	W/"1831595"	Nancy Anderson (sample)	someone_c@example.com	0c04afdc-5d37-e911-a97c-0022480749f0
7	W/"1831653"	Patrick Sands (sample)	someone_k@example.com	1c04afdc-5d37-e911-a97c-0022480749f0
8	W/"1831630"	Paul Cannon (sample)	someone_h@example.co...	1604afdc-5d37-e911-a97c-0022480749f0
9	W/"1831637"	Rene Valdes (sample)	someone_i@example.com	1804afdc-5d37-e911-a97c-0022480749f0
10	W/"1831623"	Robert Lyon (sample)	someone_g@example.co...	1404afdc-5d37-e911-a97c-0022480749f0
11	W/"1831616"	Scott Konersmann (sample)	someone_f@example.com	1204afdc-5d37-e911-a97c-0022480749f0
12	W/"1831609"	Sidney Higa (sample)	someone_e@example.co...	1004afdc-5d37-e911-a97c-0022480749f0
13	W/"1831660"	Susan Burk (sample)	someone_l@example.com	1e04afdc-5d37-e911-a97c-0022480749f0
14	W/"1831588"	Susanna Stubberod (sample)	someone_b@example.co...	0a04afdc-5d37-e911-a97c-0022480749f0
15	W/"998129"	Test	null	b10977d7-7b1e-e911-a970-0022480130...
16	W/"998063"	Test	null	2525972a-751e-e911-a971-0022480140fe
17	W/"1831667"	Thomas Andersen (sample)	someone_m@example.c...	2004afdc-5d37-e911-a97c-0022480749f0
18	W/"1831581"	Yvonne McKay (sample)	someone_a@example.co...	0804afdc-5d37-e911-a97c-0022480749f0



GenerateFetchXMLResults - M Query.txt

AS ALWAYS, THE COMMUNITY DELIVERS...



Power Query (M) Builder

Version: 1.2018.1014.5

Author: Mohamed Rasheed (ITLec) and Ulrik "CRM Chart Guy" Carlsson (eLogic LLC)

Create Power Query (M) scripts for Dynamics 365 and Power BI

- Lets you generate M Code queries based off Entity views or FetchXML Queries; full support for paging.
- Can also generate OData queries
- Generates OptionSet label values too

In short, an AMAZING tool!

<https://www.xrmttoolbox.com/plugins/PowerQueryBuilder/>

DEMO

USING SQL (ON-PREMISE OR DATA EXPORT SERVICE)

OVERVIEW

The underlying database technology for D365CE is SQL Server, which can be exposed entirely as part of on-premise deployments or, for online, the Data Export Service can be “bolted on” to sync data to a SQL database.

- + Allows you to leverage full capability of T-SQL when querying D365CE data
- + Data Export Service delta-syncs provide near real-time view of data.
- + Greater level of control over database capacity, performance etc.
- Requires an infrastructure commitment, either on-premise or cloud.
- For Data Export Service, Azure subscription is required, additional billing/infrastructure needs to be maintained and some limitations on the entities that can be synchronized.
- Familiarity with how D365CE handles underlying data types is still required.

VERDICT

Recommended solution for D365CE online deployments that require more complex and scalable reporting needs or where significant existing T-SQL technical knowledge exists within your team.

DATA EXPORT SERVICE OVERVIEW

AppSource

Apps for Dynamics 365

×

< Apps



Microsoft Dynamics 365 - Data Export Service

Microsoft Dynamics 365

Overview

Reviews

GET IT NOW

★★★★★

Products

[Dynamics 365 for Sales](#)
[Dynamics 365 for Customer ...](#)
[Dynamics 365 for Field Service](#)
[Dynamics 365 for Project Ser...](#)

Publisher

Microsoft Dynamics 365

Acquire Using

Work or school account

Version

8.0

Updated

11/2/2016

Categories

[Marketing](#)
[Sales](#)

Support

This service exports schema and data from Dynamics 365 (online) to customer owned Azure SQL database

Data Export Service is an add-on service for Dynamics 365 (online) that adds the ability to replicate sales, service and marketing data to a SQL store in a customer-owned Azure subscription. It simplifies the technical and administrative complexity of deploying and managing a data export solution - managing schema and data. You will be up and running in a matter of few minutes to export data to Azure

- Export profiles configure entities and relationships to synchronize data with the destination database. Destination schema is automatically created and updated based on entity and relationship definition
- Metadata changes such as addition or modification of fields are automatically synchronized
- Full initial data synchronization
- Push based delta synchronization as changes occur in the Dynamics 365. Delta changes are pushed in a matter of few minutes
- Built-in recovery for addressing transient failures
- Delete log to track deletes along with their timestamps
- Download failure records with failure reason for error encountered during synchronization
- Monitoring and diagnostics on sync progress
- Scalable, reliable and secure cloud service operated by Microsoft
- APIs for programmatic management of export profiles

Available at: North America South America Europe Middle East Africa Japan Asia/Pacific Australia

- “Free” add-on solution for D365CE Online
- Allows you continually sync D365CE data to a Azure SQL database or SQL Server on a Windows VM.
- One-way sync
- Required setup:
 - Provision Azure environment:
 - SQL Database OR VM with SQL Server
 - Azure Key Vault
 - Install Data Export Managed Solution in D365CE
 - Define Data Export Profile (i.e. list of entities to sync)
 - Begin sync:
 - Metadata
 - Initial data sync (can take a while!)
 - Continuous delta data sync.
- Effective replacement solution for SSIS, Kingswaysoft or Scribe Online solutions, where complex transformation options are not required during the sync process.

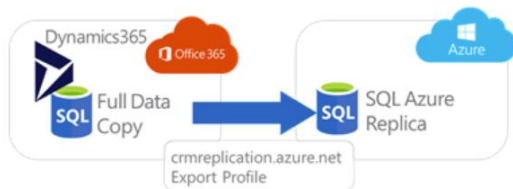
Dynamic365 Data Export Service

BY SCOTT-DUROW / DEC 09, 2016 / DYNAMICS365, SPARKLE XRM

SHARE

If you've moved to Dynamics CRM/365 Online then the likelihood is that you've come up against the limitation of not being able to query the SQL database directly to perform more complex reporting or for custom integrations. Many on premises deployments rely on querying the backend databases and in the past this has been a blocker to moving to the cloud – or at least it has meant a complex and costly integration to copy the data from Dynamics 365 to a on prem SQL database.

The introduction of the Data Export Service is a real game changer with the possibility to replicate your data from Dynamics CRM/365 online to an Azure SQL database in your own Azure Subscription. Once you have your data in a SQL Database you can then using PowerBI, integrate with other systems and create a data warehouse. I've found that the speed of the replication is impressive, being minutes/seconds and not hours.



There are a number of prerequisites to enabling this which you can read about in msdn:
<https://technet.microsoft.com/en-us/library/mt744592.aspx>

PAGELIST

[Download License](#)
[Ribbon Workbench](#)

TAGCLOUD

CRM 2011 Beta CRM 2011 Development
 CRM 2011 Development'Must Knows'
 CRM 2013 Development CRM 2015 Development
 CRM 2016 Development Document Management
 Dynamics365 Javascript Licensing LINQ
 'Must Knows' Plug-Ins PowerApps PowerPlatform
 Pricing Ribbon SharePoint Silverlight
 Sparkle XRM Unified Client Upgrade UR12
 Version 9 Workflows

Tweets by @ScottDurow

Scott Durow Retweeted
 David Reid @davidsreid
 If you were at, or wish you were at

<https://develop1.net/public/post/2016/12/09/Dynamic365-Data-Export-Service>

HANDLING OPTION SET, STATUS & STATUS REASON VALUES

```
SELECT fullname, _jobtitle
FROM dbo.contact
ORDER BY fullname
```

100 %

	fullname	_jobtitle
1	Andrew	805070109
2	Ian	805070154
3	Jane	805070060
4	Jill	805070154
5	Kevin	805070142
6	Sandra	805070066

```
SELECT fullname, _jobtitle, GOSM.[LocalizedLabel]
FROM dbo.contact AS C
INNER JOIN dbo.GlobalOptionSetMetadata AS GOSM
ON C._jobtitle = GOSM.[Option]
AND ' _jobtitle' = GOSM.OptionSetName
WHERE LocalizedLabelLanguageCode = 1033
ORDER BY fullname
```

100 %

	fullname	_jobtitle	LocalizedLabel
1	Andrew	805070109	Managing Director - Commercial
2	Ian	805070154	Operations Manager
3	Jane	805070060	Events Manager
4	Jill	805070154	Operations Manager
5	Kevin	805070142	Managing Director
6	Sandra	805070066	General Manager



HANDLING OPTION SET, STATUS & STATUS REASON VALUES

```
CREATE FUNCTION [dbo].[fnGetGlobalOptionSetLabel]
(
    @GlobalOptionSetName NVARCHAR(64),
    @Option INT,
    @LanguageCode INT
)
RETURNS NVARCHAR(256)
AS
BEGIN
    DECLARE @Label NVARCHAR(256);
    DECLARE @RecordCount INT = (SELECT COUNT(*) FROM dbo.GlobalOptionSetMetadata WHERE OptionSetName = @GlobalOptionSetName AND [Option] = @Option AND LocalizedLabelLanguageCode = @LanguageCode);
    IF @RecordCount = 1
        SET @Label = (SELECT TOP 1 LocalizedLabel FROM dbo.GlobalOptionSetMetadata WHERE OptionSetName = @GlobalOptionSetName AND [Option] = @Option AND LocalizedLabelLanguageCode = @LanguageCode);
    ELSE
        SET @Label = CAST('An error has occurred. Could not obtain label for Global Option Set field ' + @GlobalOptionSetName AS INT);
    RETURN @Label;
END
GO
```



```
SELECT fullname, dbo.fnGetGlobalOptionSetLabel(' _jobtitle', _jobtitle, 1033) AS JobTitle
FROM dbo.contact
ORDER BY fullname
```

100 %

Results Messages

	fullname	JobTitle
1	Andrew	Managing Director - Commercial
2	Ian	Operations Manager
3	Jane	Events Manager
4	Jill	Operations Manager
5	Kevin	Managing Director
6	Sandra	General Manager



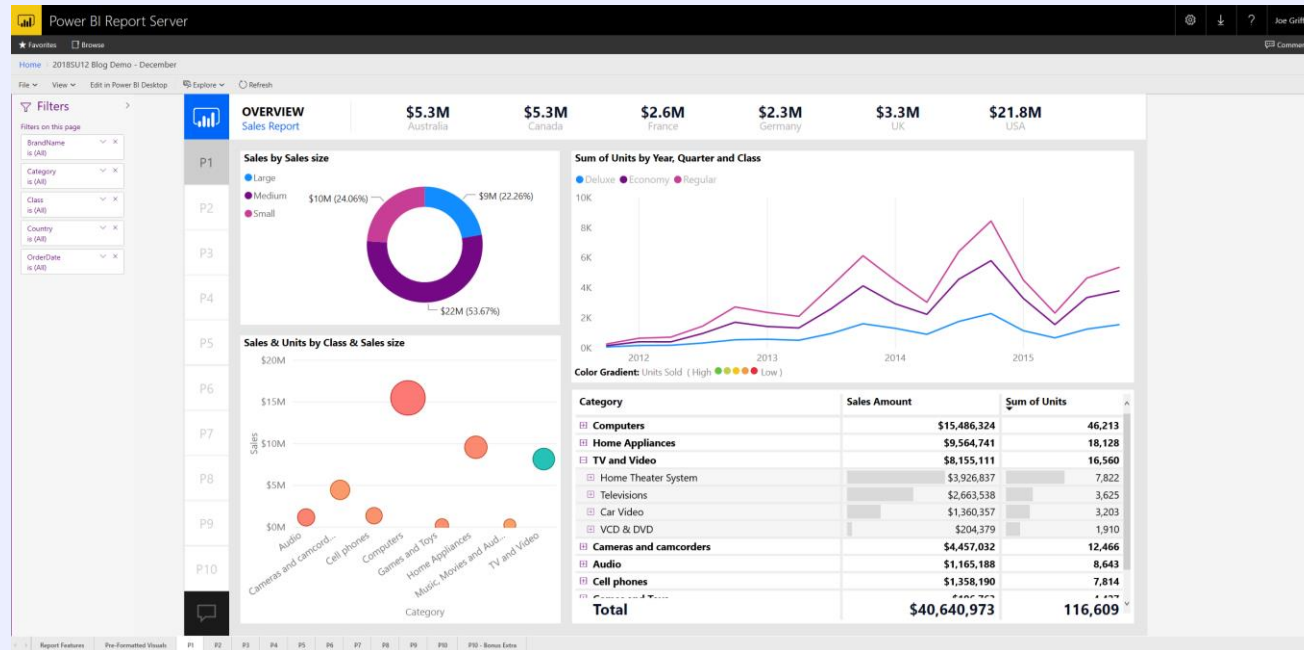
DataExportService_HelperFunctions.sql

COUPLE MORE THINGS TO REMEMBER...

- Record lookups are stored as GUID values, including for **ownerid** values – be prepared to do plenty of joins in your queries!
- Data Export Service creates some additional tables, which may be of use:
 - **AttributeMetadata** - Stores an overview of each attribute synced across – useful for detecting changes and also as a reference for field data types.
 - **DeleteLog** – Records the ID and date for each record deleted.
 - **TargetMetadata** – Summary table of all the defined relationships included as part of the sync.
- P1 Premium is recommended SKU for Azure SQL, but S functions fine for smaller workloads; Azure Automation can be used to auto-scale your database.
- It's YOUR database, so feel free to bolt-on additional functionality to help suit your specific requirements, so long as it does not alter the base tables that sync data.

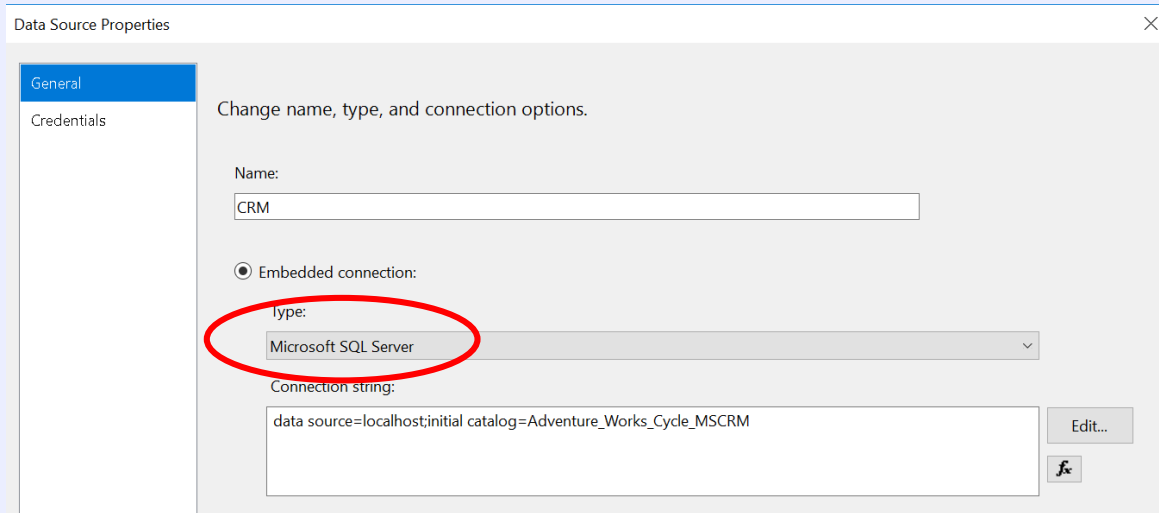
MIGRATING D365CE REPORTS TO
POWER BI PREMIUM / REPORT
SERVER: IS IT POSSIBLE?

POWER BI PREMIUM / REPORT SERVER OVERVIEW



- Power BI Premium and Report Server now offer Paginated Reports i.e. the ability to deploy and utilise SSRS reports.
- Enables organisations to leverage the benefits of their existing SSRS investments, whilst also being able to take advantage of the full range of Power BI functionality.
- Enterprise-ready, with flexible deployment options (cloud or on-premise)
- Power BI Report Server essentially a “beefed up” version of SSRS.

SQL REPORTS (ON-PREMISE ONLY)



The 'Data Source Properties' dialog box is shown with the 'General' tab selected. The 'Name' field contains 'CRM'. Under 'Embedded connection:', the 'Type' dropdown is set to 'Microsoft SQL Server', which is circled in red. The 'Connection string' field contains 'data source=localhost;initial catalog=Adventure_Works_Cycle_MSCRM'. There are 'Edit...' and 'fx' buttons next to the connection string field.

Data Source Properties

General

Credentials

Change name, type, and connection options.

Name:

CRM

☒ Embedded connection:

Type:

Microsoft SQL Server

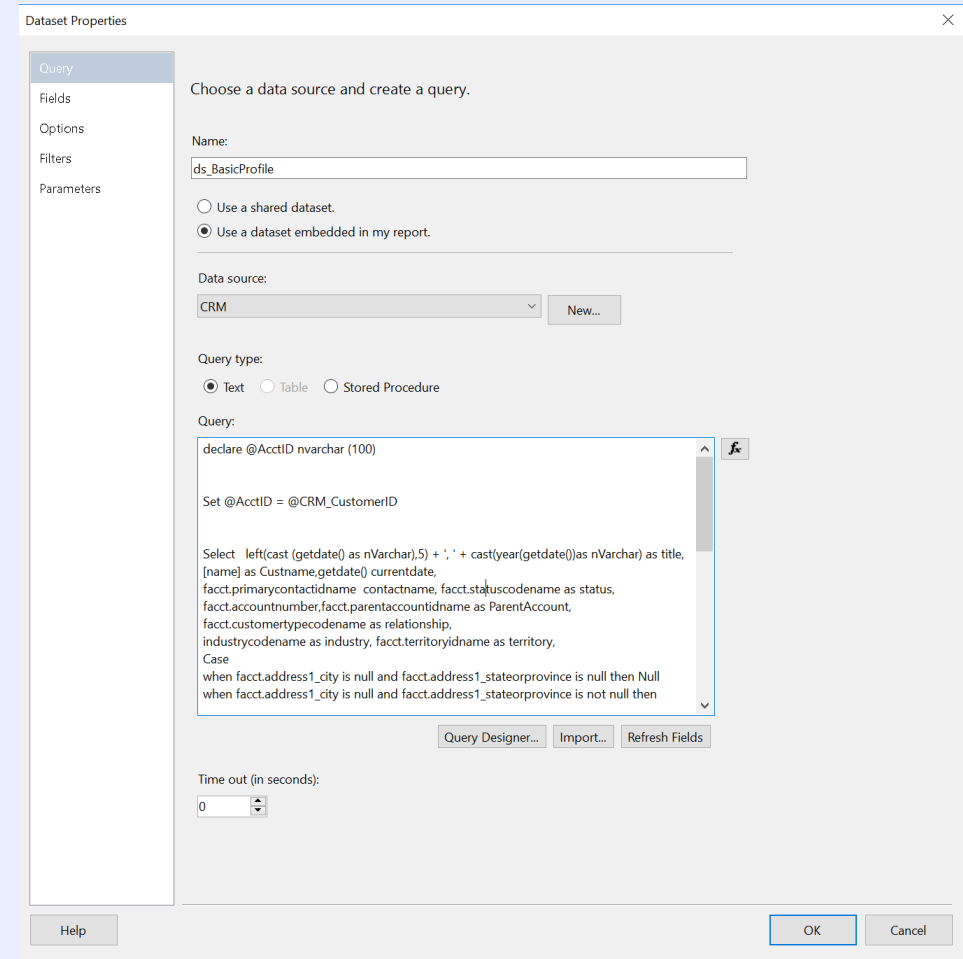
Connection string:

data source=localhost;initial catalog=Adventure_Works_Cycle_MSCRM

Edit...

fx

Remember: NO direct SQL database access for online.



The 'Dataset Properties' dialog box is shown with the 'Query' tab selected. The 'Name' field contains 'ds_BasicProfile'. The 'Data source' dropdown is set to 'CRM'. The 'Query type' is set to 'Text'. The 'Query' field contains a SQL query. There are 'Query Designer...', 'Import...', and 'Refresh Fields' buttons below the query field. The 'Time out (in seconds)' field is set to 0. There are 'OK' and 'Cancel' buttons at the bottom right.

Dataset Properties

Query

Fields

Options

Filters

Parameters

Choose a data source and create a query.

Name:

ds_BasicProfile

☐ Use a shared dataset.

☒ Use a dataset embedded in my report.

Data source:

CRM

New...

Query type:

☒ Text ☐ Table ☐ Stored Procedure

Query:

```
declare @AcctID nvarchar (100)

Set @AcctID = @CRM_CustomerID

Select left(cast (getdate() as nvarchar,5) + ' ' + cast(year(getdate()) as nvarchar) as title,
[name] as Custname,getdate() currentdate,
facct.primarycontactidname contactname, facct.statuscodename as status,
facct.accountnumber,facct.parentaccountidname as ParentAccount,
facct.customertypecodename as relationship,
industrycodename as industry, facct.territoryidname as territory,
Case
when facct.address1_city is null and facct.address1_stateorprovince is null then Null
when facct.address1_city is null and facct.address1_stateorprovince is not null then
```

Query Designer... Import... Refresh Fields

Time out (in seconds):

0

Help

OK

Cancel

FETCH-BASED REPORTS (ONLINE/ON-PREMISE)

Name:
JJGCRM

☒ Embedded connection:

Type:
Microsoft Dynamics 365 Fetch

Connection string:
https://jjg.crm11.dynamics.com:jjg

☐ Use shared data source reference

☐ Use single transaction when processing the queries

<https://docs.microsoft.com/en-us/dynamics365/customer-engagement/on-premises/install-microsoft-dynamics-365-reporting-extensions>

Dataset Properties

Query

Choose a data source and create a query.

Name:
ActiveContacts

☐ Use a shared dataset.
☒ Use a dataset embedded in my report.

Data source:
JJGCRM

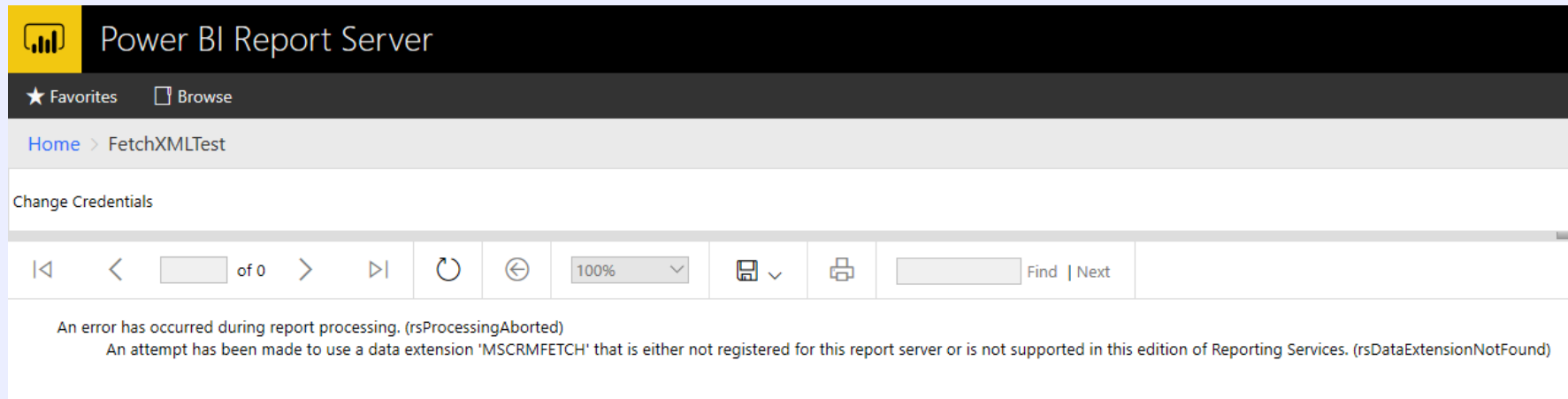
Query type:
☒ Text ☐ Table ☐ Stored Procedure

Query:
<fetch mapping="logical" output-format="xml-platform" version="1.0" distinct="false">
 <entity name="contact">
 <attribute name="fullname" />
 <attribute name="parentcustomerid" />
 <attribute name="telephone1" />
 <attribute name="emailaddress1" />
 <attribute name="contactid" />
 <order descending="false" attribute="fullname" />
 <filter type="and">
 <condition value="0" attribute="statecode" operator="eq" />
 </filter>
 </entity>
</fetch>

Query Designer... Import... Refresh Fields

Time out (in seconds):
0

SO THE QUESTION IS: CAN WE
HAVE FETCHXML PAGINATED
REPORTS?



SO WHAT TO DO?

- Connect directly to a Data Export database (if existing)
 - Out of the box connector, so easy to get hooked up to.
 - Allows you to leverage T-SQL fully when defining your queries.
 - Requires Azure knowledge and additional investments to maintain.
- Based on my testing, you cannot:
 - Use the XML connector to query the Web API, as required authentication types are not supported.
 - Leverage an ISV connector (e.g. CData), due to the same authentication issues.
- If possible, redevelop any D365CE Report as a Power BI Report, using a supported connector; otherwise, it's SQL or bust!

WRAPPING UP

SO WHAT'S THE BEST WAY TO CONSUME CRM DATA WITHIN POWER BI?

- Getting your D365CE data into SQL does make it a lot easier for traditional BI developers to consume data from the application...
- ...provided that they have some awareness of how the application stores option set values, lookup fields etc.
- Common Data Service connector fixes many glaring issues with the Dynamics 365 connector and should be the go-to destination when building out a report from scratch.
- For more advanced requirements, consider going down the SQL route.

CLOSING THOUGHTS

- Using Power BI just to access only D365CE data does not make any sense...yet...
- Take into account all licensing considerations; anticipate that this will be simplified in due course with a “Power Platform” SKU.
- “Legacy” components are being stripped out of CRM at increasing pace:
 - SSRS within CRM represents a problem for both customers and Microsoft; ideal solution would be to offer paginated reports as part of Power BI Professional. Start thinking about how these reports can either be a) converted to a paginated version or b) replaced with an alternative solution (e.g. Word Templates)
- Power BI does represent a significant opportunity to bring CRM “into the 21st century”, particularly if they choose to embed it closely à la Business Central.

THANK YOU FOR LISTENING!
ANY QUESTIONS...?



Joe Griffin

 <https://crmchap.co.uk>

 joe@griffin.gb.net

 joejgriffin

 joejgriffin

 JJGriffin