# HCDW TDD - PBI Workspace

All reports for Model Documentation will be named with pre-fix, "**MODEL DOC -** ", and are deployed in the workspace "**HCDW TDD Models**".

| Link | Resource | Description |
|---|---|---|
| HCDW TDD Models | Power BI workspace | The Model Documentation reports will be published & analyzed in this PBI Workspace, "HCDW TDD Models". This workspace contains other TDD report as well (such as "Column Cleaner" and "Field Finder"). All reports for Model Documentation will be named with pre-fix, "**MODEL DOC -** ". |
| MODEL DOC - VA Time to Hire Dashboard | Power BI report | Example documentation, MODEL DOC - VA Time to Hire Dashboard. This is one example of model documentation report created by this template plugin. |

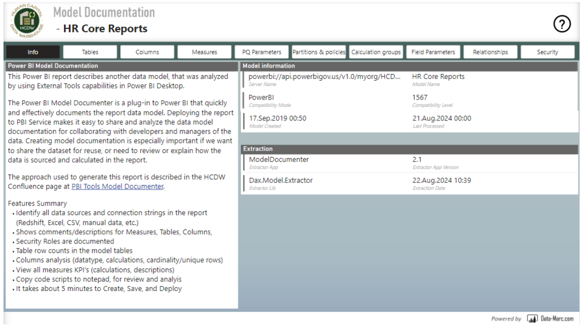
# REPORT PAGES

> **Different Report Examples**
>
> Please note:
>
> - To demonstrate documentation capabilities, different report examples are used in the screenshots below
> - HCDW Template examples are included, as well as the Default Template examples

## Info

The info page includes all generic information about the data model, such as ***compatibility mode and level***, but also when the data model was created and when it was ***last processed***. From here, you can navigate through the report and find all other information about the data model. Also, on top it shows the ***name of the model*** and the ***API path***. NOTE: If the Model Documenter was run from Power BI Desktop files instead of PBI Service model, you will see a GUID shown, instead of the model name.

HCDW TEMPLATE



**Power BI Model Documentation**

This Power BI report describes another data model, that was analyzed by using External Tools capabilities in Power BI Desktop.

The Power BI Model Documenter is a plug-in to Power BI that quickly and effectively documents the report data model. Deploying the report to PBI Service makes it easy to share and analyze the data model documentation for collaborating with developers and managers of the data. Creating model documentation is especially important if we want to share the dataset for reuse, or need to review or explain how the data is sourced and calculated in the report.

The approach used to generate this report is described in the HCDW Confluence page at PBI Tools Model Documenter.

Features Summary

- Identify all data sources and connection strings in the report (Redshift, Excel, CSV, manual data, etc.)
- Shows comments/descriptions for Measures, Tables, Columns,
- Security Roles are documented
- Table row counts in the model tables
- Columns analysis (datatype, calculations, cardinality/unique rows)
- View all measures KPI's (calculations, descriptions)
- Copy code scripts to notepad, for review and analyis
- It takes about 5 minutes to Create, Save, and Deploy

**Model information**

| | |
|---|---|
| powerbi://api.powerbigov.us/v1.0/myorg/HCD...<br>Server Name | HR Core Reports<br>Model Name |
| PowerBI<br>Compatibility Mode | 1567<br>Compatibility Level |
| 17.Sep.2019 00:50<br>Model Created | 21.Aug.2024 00:00<br>Last Processed |

**Extraction**

| | |
|---|---|
| ModelDocumenter<br>Extractor App | 2.1<br>Extractor App Version |
| Dax.Model.Extractor<br>Extractor Lib | 22.Aug.2024 10:39<br>Extraction Date |

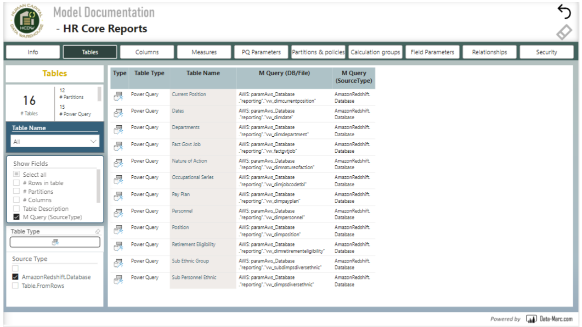
DEFAULT TEMPLATE

blocked URL

## Tables

The Tables page includes information about all tables in the data model. Use the "Show Fields" options to customize the metrics fields to be displayed in the table-- ***# Rows, # Columns, Table Description, Query Source Type, Query DB/File***.

HCDW TEMPLATE



**Tables**

16 # Tables
12 # Partitions
15 # Power Query

Table Name: All

Show Fields
- ☐ Select all
- ☐ # Rows in table
- ☐ # Partitions
- ☐ # Columns
- ☐ Table Description
- ☑ M Query (SourceType)

Table Type

Source Type
- ☐
- ☑ AmazonRedshift.Database
- ☐ Table.FromRows

| Type | Table Type | Table Name | M Query (DB/File) | M Query (SourceType) |
|---|---|---|---|---|
| | Power Query | Current Position | AWS: paramAws_Database ."reporting"."vw_dimcurrentposition" | AmazonRedshift. Database |
| | Power Query | Dates | AWS: paramAws_Database ."reporting"."vw_dimdate" | AmazonRedshift. Database |
| | Power Query | Departments | AWS: paramAws_Database ."reporting"."vw_dimdepartment" | AmazonRedshift. Database |
| | Power Query | Fact Govt Job | AWS: paramAws_Database ."reporting"."vw_factgvtjob" | AmazonRedshift. Database |
| | Power Query | Nature of Action | AWS: paramAws_Database ."reporting"."vw_dimnatureofaction" | AmazonRedshift. Database |
| | Power Query | Occupational Series | AWS: paramAws_Database ."reporting"."vw_dimjobcodetbl" | AmazonRedshift. Database |
| | Power Query | Pay Plan | AWS: paramAws_Database ."reporting"."vw_dimpayplan" | AmazonRedshift. Database |
| | Power Query | Personnel | AWS: paramAws_Database ."reporting"."vw_dimpersonnel" | AmazonRedshift. Database |
| | Power Query | Position | AWS: paramAws_Database ."reporting"."vw_dimposition" | AmazonRedshift. Database |
| | Power Query | Retirement Eligibility | AWS: paramAws_Database ."reporting"."vw_dimretirementeligibility" | AmazonRedshift. Database |
| | Power Query | Sub Ethnic Group | AWS: paramAws_Database ."reporting"."vw_subdimpsdiversethnic" | AmazonRedshift. Database |
| | Power Query | Sub Personnel Ethnic | AWS: paramAws_Database ."reporting"."vw_dimpsdiversethnic" | AmazonRedshift. Database |

***Source Type*** will tell if the data comes from CSV/ Excel/ SharePoint/ Databases sources. ***DB File*** says the name of the file pulled from the source. ***Table Description*** provides functional description of the table describing where it came from. You can also choose to see relevant information like the ***storage mode*** (Import / Direct Query / Dual), as well as the ***number of rows***.

Also the ***table type*** describes if the table is generated using Data Analysis Expression (DAX), M (Power Query), or using an Incremental Refresh policy. While hovering over a table, the tooltip will show up, containing information about the specific table-- Table state, Last refresh time, Last modified time. By selecting a single table name, you can active the following drill through options-- Measures (button 1), Partition (button 2), or Columns (button 3).

## Columns

The columns page shows an overview of all columns in the data model, and to which table they belong. Additional information is shown such as the ***column cardinality*** (number of unique values in the column), ***sort order*** (if defined), ***format string*** (if specified). Also there is an indicator when a column is generated using Data Analysis Expression (DAX).

Use the "Show Fields" options to explore the information and customize the metrics fields to be displayed in the table-- ***Format String, Data Type, Data Size, Col Description, Col Expression***. The ***Col Description*** provides functional description of the column describing where it came from or how the data field is derived.

To export the full table dataset and further analyze the columns/values, we use DAX Studio (Read More). Simply copy /paste the name table from documentation, enter the sample script in DAX Studio, and run the script.

**DAX Studio (export dataset)**

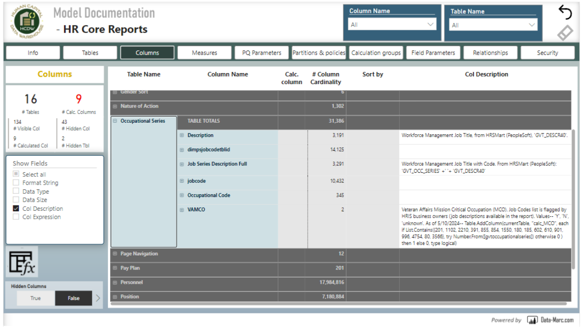
```
        // All data in a
table
EVALUATE <Table Name>

// Filtered data in a table
EVALUATE
CALCULATETABLE ( Customer,
Customer[City] = "Redmond"
)
```

DEFAULT TEMPLATE

blocked URL

HCDW TEMPLATE



Model Documentation
- HR Core Reports

Show Fields

□ Select all
□ Format String
□ Data Type
□ Data Size
☑ Col Description
□ Col Expression

| Table Name | Column Name | Calc. column | # Column Cardinality | Sort by | Col Description |
|---|---|---|---|---|---|
| Gender Sort | | | 6 | | |
| Nature of Action | | | 1,302 | | |
| Occupational Series | TABLE TOTALS | | 31,386 | | |
| | Description | | 3,191 | | Workforce Management Job Title, from HRSMart (PeopleSoft). 'GVT_DESCR40'. |
| | dimpsjobcodetblid | | 14,125 | | |
| | Job Series Description Full | | 3,291 | | Workforce Management Job Title with Code. From HRSMart (PeopleSoft): 'GVT_OCC_SERIES' +' '+ 'GVT_DESCR40' |
| | jobcode | | 10,432 | | |
| | Occupational Code | | 345 | | |
| | VAMCO | | 2 | | Veteran Affairs Mission Critical Occupation (MCO). Job Codes list is flagged by HRIS business owners (job descriptions available in the report). Values-- 'Y', 'N', 'unknown'. As of 5/10/2024-- Table.AddColumn(currentTable, "calc_MCO", each if List.Contains({201, 1102, 2210, 391, 855, 854, 1550, 180, 185, 602, 610, 901, 996, 4754, 80, 3566}, try Number.From([gvtoccupationalseries]) otherwise 0 ) then 1 else 0, type logical) |
| Page Navigation | | | 12 | | |
| Pay Plan | | | 201 | | |
| Personnel | | | 17,984,816 | | |
| Position | | | 7,180,884 | | |

DEFAULT TEMPLATE

blocked URL

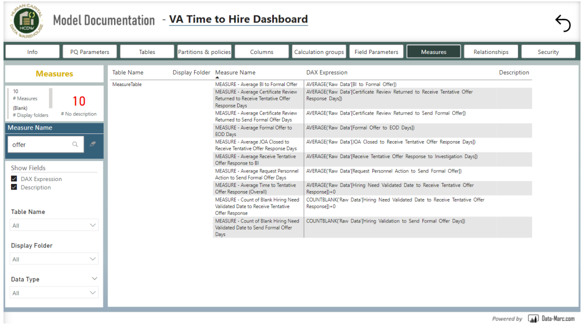
# Measures

Measure page includes all details about the ***DAX measures*** in the data model. The overview directly shows the table where the measures are located, ***measure names*** and ***descriptions*** (if added by the developer).

The measure page allows you to show /hide fields such as ***DAX expression*** or ***Description***, allowing you to customize the page for the best viewing experience you need. There is also a "search option", simply type in a string and it will instantly filter to any matching measure names.

Adding functional descriptions are key to your elements created in Power BI, especially if you share the dataset for self-service purposes. Read more about the importance of descriptions in this blog post.

HCDW TEMPLATE



Model Documentation - VA Time to Hire Dashboard

Measures

10 # Measures
(Blank) # Display folders
10 # No description

Measure Name: offer

Show Fields
☑ DAX Expression
☑ Description

Table Name: All
Display Folder: All
Data Type: All

| Table Name | Display Folder | Measure Name | DAX Expression | Description |
|---|---|---|---|---|
| MeasureTable |  | MEASURE - Average BI to Formal Offer | AVERAGE('Raw Data'[BI to Formal Offer]) |  |
|  |  | MEASURE - Average Certificate Review Returned to Receive Tentative Offer Response Days | AVERAGE('Raw Data'[Certificate Review Returned to Receive Tentative Offer Response Days]) |  |
|  |  | MEASURE - Average Certificate Review Returned to Send Formal Offer Days | AVERAGE('Raw Data'[Certificate Review Returned to Send Formal Offer]) |  |
|  |  | MEASURE - Average Formal Offer to EOD Days | AVERAGE('Raw Data'[Formal Offer to EOD Days]) |  |
|  |  | MEASURE - Average JOA Closed to Receive Tentative Offer Response Days | AVERAGE('Raw Data'[JOA Closed to Receive Tentative Offer Response Days]) |  |
|  |  | MEASURE - Average Receive Tentative Offer Response to BI | AVERAGE('Raw Data'[Receive Tentative Offer Response to Investigation Days]) |  |
|  |  | MEASURE - Average Request Personnel Action to Send Formal Offer Days | AVERAGE('Raw Data'[Request Personnel Action to Send Formal Offer]) |  |
|  |  | MEASURE - Average Time to Tentative Offer Response (Overall) | AVERAGE('Raw Data'[Hiring Need Validated Date to Receive Tentative Offer Response])+0 |  |
|  |  | MEASURE - Count of Blank Hiring Need Validated Date to Receive Tentative Offer Response | COUNTBLANK('Raw Data'[Hiring Need Validated Date to Receive Tentative Offer Response])+0 |  |
|  |  | MEASURE - Count of Blank Hiring Need Validated Date to Send Formal Offer Days | COUNTBLANK('Raw Data'[Hiring Validation to Send Formal Offer Days]) |  |

Powered by Data-Marc.com

DEFAULT TEMPLATE

blocked URL

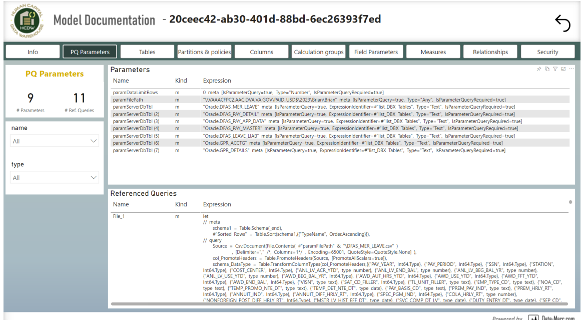
# PQ Parameters

Introduced starting Model Documenter v2.1.0 On the parameter page, you will find two things, being Power Query parameters and referenced queries.

For Parameters, you will see the ***current value of these parameters*** and the expression which tells you whether the parameter is ***required*** and the ***value type***. In case you have a list of options provided in the parameter setting, these will not directly show.

For ***Referenced queries***, you will see all queries you build in Power Query, but did not load to your model. These queries are listed and show the M-query expression.

HCDW TEMPLATE



Model Documentation - 20ceec42-ab30-401d-88bd-6ec26393f7ed

PQ Parameters

9 # Parameters
11 # Ref. Queries

name: All
type: All

Parameters

| Name | Kind | Expression |
|---|---|---|
| paramDataLimitRows | m | 0 meta [IsParameterQuery=true, Type="Number", IsParameterQueryRequired=true] |
| paramFilePath | m | "\\VAAACFPC2.AAC.DVA.VA.GOV\PAID_USD$\2023\Brian\Brian" meta [IsParameterQuery=true, Type="Any", IsParameterQueryRequired=true] |
| paramServerDbTbl | m | "Oracle.DFAS_MER_LEAVE" meta [IsParameterQuery=true, ExpressionIdentifier=#"list_DBX Tables", Type="Text", IsParameterQueryRequired=true] |
| paramServerDbTbl (2) | m | "Oracle.DFAS_PAY_DETAIL" meta [IsParameterQuery=true, ExpressionIdentifier=#"list_DBX Tables", Type="Text", IsParameterQueryRequired=true] |
| paramServerDbTbl (3) | m | "Oracle.DFAS_PAY_APP_DATA" meta [IsParameterQuery=true, ExpressionIdentifier=#"list_DBX Tables", Type="Text", IsParameterQueryRequired=true] |
| paramServerDbTbl (4) | m | "Oracle.DFAS_PAY_MASTER" meta [IsParameterQuery=true, ExpressionIdentifier=#"list_DBX Tables", Type="Text", IsParameterQueryRequired=true] |
| paramServerDbTbl (5) | m | "Oracle.DFAS_LEAVE_LIAB" meta [IsParameterQuery=true, ExpressionIdentifier=#"list_DBX Tables", Type="Text", IsParameterQueryRequired=true] |
| paramServerDbTbl (6) | m | "Oracle.GPR_ACCTG" meta [IsParameterQuery=true, ExpressionIdentifier=#"list_DBX Tables", Type="Text", IsParameterQueryRequired=true] |
| paramServerDbTbl (7) | m | "Oracle.GPR_DETAILS" meta [IsParameterQuery=true, ExpressionIdentifier=#"list_DBX Tables", Type="Text", IsParameterQueryRequired=true] |

Referenced Queries

| Name | Kind | Expression |
|---|---|---|
| File_1 | m | (expression below) |

```
let
// meta
    schema1 = Table.Schema(_end),
    #"Sorted Rows" = Table.Sort(schema1,{{"TypeName", Order.Ascending}}),
// query
    Source = Csv.Document(File.Contents( #"paramFilePath" & "\DFAS_MER_LEAVE.csv" )
            , [Delimiter="," /*, Columns=1*/ , Encoding=65001, QuoteStyle=QuoteStyle.None] ),
    col_PromoteHeaders = Table.PromoteHeaders(Source, [PromoteAllScalars=true]),
    schema_DataType = Table.TransformColumnTypes(col_PromoteHeaders,{{"PAY_YEAR", Int64.Type}, {"PAY_PERIOD", Int64.Type}, {"SSN", Int64.Type}, {"STATION",
Int64.Type}, {"COST_CENTER", Int64.Type}, {"ANL_LV_ACR_YTD", type number}, {"ANL_LV_END_BAL", type number}, {"ANL_LV_BEG_BAL_YR", type number},
{"ANL_LV_USE_YTD", type number}, {"AWD_BEG_BAL_YR", Int64.Type}, {"AWD_AUT_HRS_YTD", Int64.Type}, {"AWD_USE_YTD", Int64.Type}, {"AWD_FFT_YTD",
Int64.Type}, {"AWD_END_BAL", Int64.Type}, {"VISN", type text}, {"SAT_CD_FILLER", Int64.Type}, {"TL_UNIT_FILLER", type text}, {"EMP_TYPE_CD", type text}, {"NOA_CD",
type text}, {"TEMP_PROMO_NTE_DT", type text}, {"TEMP_DET_NTE_DT", type date}, {"PAY_BASIS_CD", type text}, {"PREM_PAY_IND", type text}, {"PREM_HRLY_RT",
Int64.Type}, {"ANNUIT_IND", Int64.Type}, {"ANNUIT_DIFF_HRLY_RT", Int64.Type}, {"SPEC_PGM_IND", Int64.Type}, {"COLA_HRLY_RT", type number},
{"NONFOREIGN_POST_DIFF_HRLY_RT", Int64.Type}, {"MSTR_LV_HIST_EFF_DT", type date}, {"SVC_COMP_DT_LV", type date}, {"DUTY_ENTRY_DT", type date}, {"SEP_CD",
```

Powered by Data-Marc.com

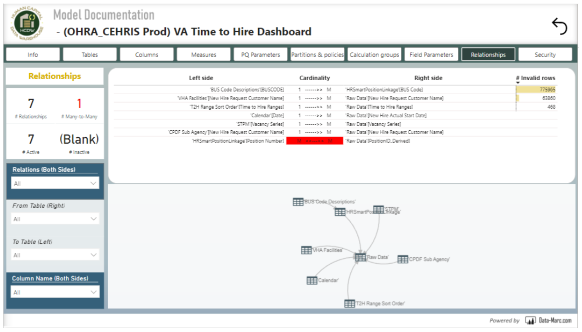
DEFAULT TEMPLATE

blocked URL

# Relationships

The relationships view gives an overview of all data relationships in the semantic model (equivalent to SQL Join in relation database terms). Use the filters for ***Relations Both*** (table names on either side of the relationship), and ***Column Names Both*** (see where a particular column is used in the model relations). There are two main visuals on the page: 1) On Top, a list of all relationships with the cardinality, 2) On Bottom, a visual overview of all relationships in the model.

HCDW TEMPLATE



Model Documentation
- (OHRA_CEHRIS Prod) VA Time to Hire Dashboard

Relationships

7 # Relationships
1 # Many-to-Many
7 # Active
(Blank) # Inactive

Relations (Both Sides): All
From Table (Right): All
To Table (Left): All
Column Name (Both Sides): All

| Left side | Cardinality | Right side | # Invalid rows |
|---|---|---|---|
| 'BUS Code Descriptions'[BUSCODE] | 1 ------>> M | 'HRSmartPositionLinkage'[BUS Code] | 775965 |
| 'VHA Facilities'[New Hire Request Customer Name] | 1 ------>> M | 'Raw Data'[New Hire Request Customer Name] | 63860 |
| 'T2H Range Sort Order'[Time to Hire Ranges] | 1 ------>> M | 'Raw Data'[Time to Hire Ranges] | 468 |
| 'Calendar'[Date] | 1 ------>> M | 'Raw Data'[New Hire Actual Start Date] |  |
| 'STPM'[Vacancy Series] | 1 ------>> M | 'Raw Data'[Vacancy Series] |  |
| 'CPDF Sub Agency'[New Hire Request Customer Name] | 1 ------>> M | 'Raw Data'[New Hire Request Customer Name] |  |
| 'HRSmartPositionLinkage'[Position Number] | M <<---->> M | 'Raw Data'[PositionID_Derived] |  |

Powered by Data-Marc.com

DEFAULT TEMPLATE

blocked URL

There is a reported metrics for ***invalid rows count***; This indicator shows is no matching value for rows in relationships. ***In-active relationships*** will be displayed in a grey font, where all other relationships are displayed like all other information. In case you have relationships with ***cross filter direction set to both***, or ***many-to-many*** relationships, these relationships are highlighted in red, as these types of relationships can lead to ambiguous data models and/or limited relationships.

If you want to learn semantic model relationships concept, refer to this video: [DAX Tools VertiPaq Analyzer 7 - The Relationships page | SQLBI](#).

## Calculation groups

Introduced with Model Documenter v2. 1.0 All calculation groups in the model, will show in a dedicated page to calculation groups. They will no longer show up in the tables overview, as no details were shown there. In this new dedicated page, you will see all calculation groups including the calculation items, descriptions and item expressions.

By selecting a calculation item, the expression will show on the right-hand side.

HCDW TEMPLATE

<No examples yet>

DEFAULT TEMPLATE

blocked URL

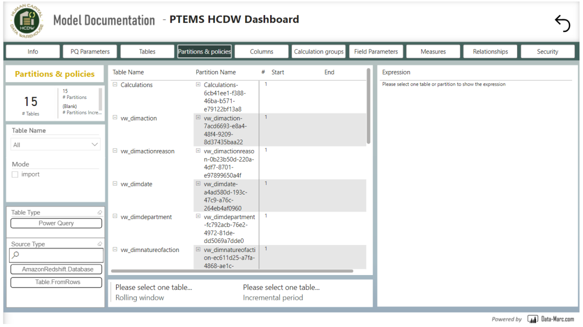
## Partitions and policies

Introduced starting Model Documenter v2.1.0 On the partitions page, you will find more information about the partitions associated to the tables in the model. You can access this page via drill through from the table page, or directly via the page navigation. All tables by default have one partition, which will show as the table name concatenated with a GUID. In case you specified Incremental Refresh, your model will show all the different partitions generated.

Please know that the ***partitions from Incremental Refresh*** are only generated in the Power BI Service. In order to visualize the partition information, you must connect using the Analysis Services connector to the XMLA endpoint of your Power BI dataset hosted in any type of Power BI Premium. Once connnected, you can run the Model Documenter from Power BI desktop to get the results out.

By selecting an individual partition, the expression of this partition will show on the right-hand side of the screen. In case of incremental refresh, the bottom of the page shows the rolling window (period of data in the model) and the incremental period (active section that is refreshed).

HCDW TEMPLATE



| Table Name | Partition Name | # | Start | End |
|---|---|---|---|---|
| Calculations | Calculations-6cb41ee1-f388-46ba-b571-e79122bf13a8 | 1 | | |
| vw_dimaction | vw_dimaction-7acd6693-e8a4-48f4-9209-8d37435baa22 | 1 | | |
| vw_dimactionreason | vw_dimactionreason-0b23b50d-220a-4df7-8701-e97899650a4f | 1 | | |
| vw_dimdate | vw_dimdate-a4ad580d-193c-47c9-a76c-264eb4af0960 | 1 | | |
| vw_dimdepartment | vw_dimdepartment-fc792acb-76e2-4972-81de-dd5069a7dde0 | 1 | | |
| vw_dimnatureofaction | vw_dimnatureofaction-ec611d25-a7fa-4868-ae1c- | 1 | | |

Please select one table...
Rolling window

Please select one table...
Incremental period

Expression

Please select one table or partition to show the expression

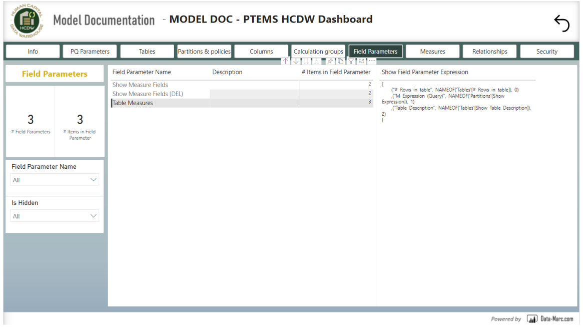
DEFAULT TEMPLATE

blocked URL

## Field parameters

HCDW TEMPLATE

Introduced starting Model Documenter v2.1.0 In case you were using Field Parameters in versions of the Model Documenter prior to v2.1.0, running the tool might have caused you issues. Introducing v2.1.0 and onwards, these issues are resolved. In case you are using field parameters, they will now show up in this dedicated page including the descriptions and number of items listed in the field parameter. By selecting a field parameter, the expression will show on the right-hand side.



- MODEL DOC - PTEMS HCDW Dashboard

**Field Parameters**

3 # Field Parameters

3 # Items in Field Parameter

Field Parameter Name: All

Is Hidden: All

| Field Parameter Name | Description | # Items in Field Parameter |
|---|---|---|
| Show Measure Fields | | 2 |
| Show Measure Fields (DEL) | | 2 |
| Table Measures | | 3 |

Show Field Parameter Expression

```
{
    ("# Rows in table", NAMEOF('Tables'[# Rows in table]), 0)
    ,("M Expression (Query)", NAMEOF('Partitions'[Show
Expression]), 1)
    ,("Table Description", NAMEOF('Tables'[Show Table Description]),
2)
}
```

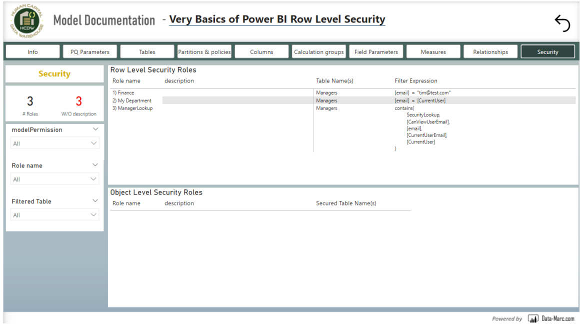
DEFAULT TEMPLATE

blocked URL

## Security

The security page shows all security roles applied to the data model. You will see the DAX expression used to filter the table, as well as which table is affected by this. Also, the description of the role is shown. Power BI Desktop does not have a native way of adding descriptions to roles. However, with Tabular Editor you can add descriptions to roles. Please read this blog post to learn how to do this.

HCDW TEMPLATE



- Very Basics of Power BI Row Level Security

**Security**

3 # Roles

3 W/O description

modelPermission: All

Role name: All

Filtered Table: All

Row Level Security Roles

| Role name | description | Table Name(s) | Filter Expression |
|---|---|---|---|
| 1) Finance | | Managers | [email] = "tim@test.com" |
| 2) My Department | | Managers | [email] = [CurrentUser] |
| 3) ManagerLookup | | Managers | contains(<br>SecurityLookup,<br>[CanViewUserEmail],<br>[email],<br>[CurrentUserEmail],<br>[CurrentUser]<br>) |

Object Level Security Roles

| Role name | description | Secured Table Name(s) |
|---|---|---|

DEFAULT TEMPLATE

blocked URL

# MODEL DOC - REFRESH SOLUTION STEPS

**Solution Steps**

The MODEL DOC report solution is created/refreshed by HCDW Developer staff.

Model Documentation cannot be updated directly in the PBI Service, by refreshing the dataset.

PBI Service dataset refresh does not work, because the model documentation is performed on the local computer, by extracting files to local computer during run-time ("C:\Power BI Model Documenter").

To refresh the documentation, use the below instructions on your local developer station

## Process

1. Start with new empty PBIX file
2. Create Analysis Services live connection with XMLA endpoint (PBI workspace)
3. Run the Model Documenter (external tools)
4. Save the file (upload first time only)

## Blank File Connection

✓ **Creating the documentation is just a few clicks**

Use a direct connection to existing data model is preferred method for creating documentation.

Using a local file connection information shows local host information, and is not as useful as the model name and workspace information.

**Start with new empty PBIX file**

- Open a blank PBIX

**Create Analysis Services Live connection with XMLA endpoint (PBI workspace)**

- PBI Desktop: PBI Ribbon | Get Data | Analysis Services
  - You may see two options and they work the exact same-- "SQL Server Analysis Services" and "Azure Analysis Services"
- Enter the "Server" connection detail prompts:
  - Use the XMLA endpoint for the PBI Workspace that contains the data model.
  - Example: **`powerbi://api.powerbigov.us/v1.0/myorg/HCDW%20Team`**
- Expand the database you wish to document | Choose the "Model" | then "OK"
- In the "Data" pane on the right, you will notice there are now some tables listed from the model

**Run the Model Documenter (external tools)**

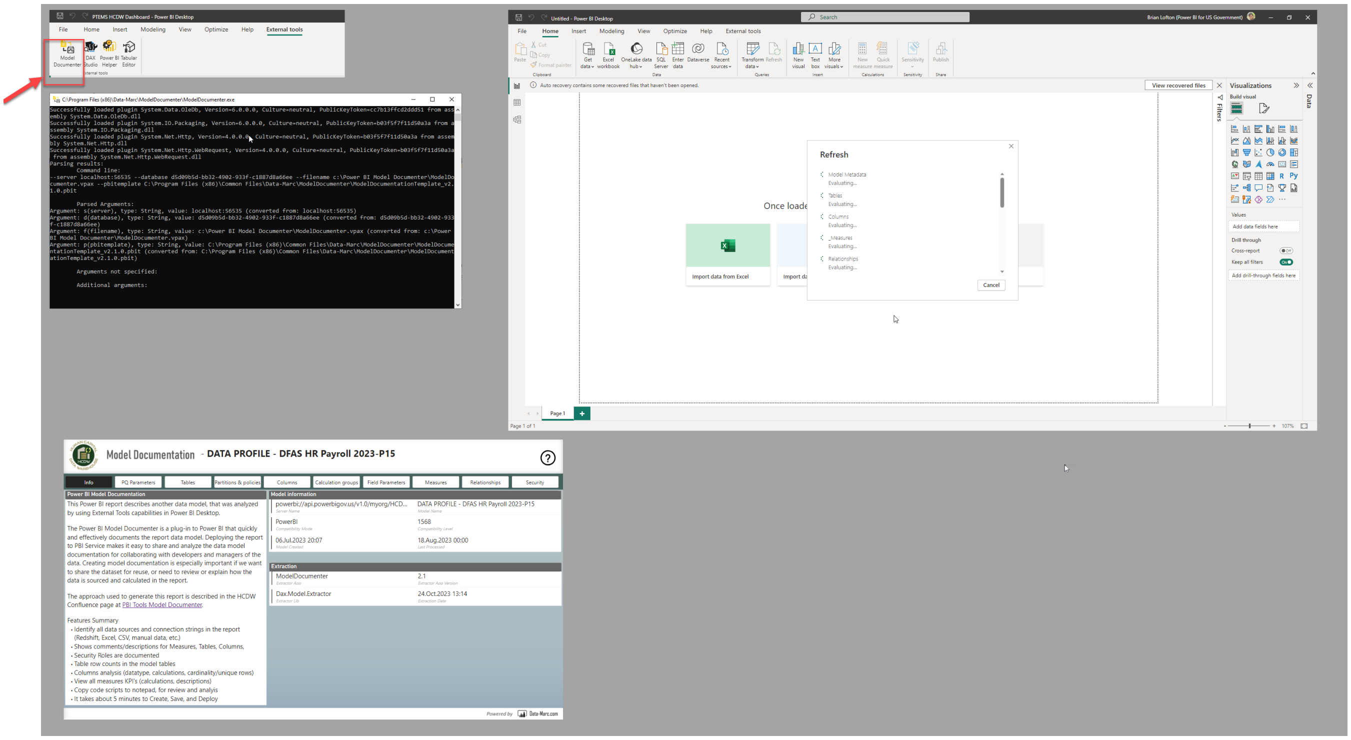
- PBI Desktop: PBI Ribbon | External Tools | Model Documenter
- Some automation will execute
  - A new PBIX file is opened
  - A prompt will appear to enter your credentials
  - Refresh window will appear and will run for 1-2 minutes
  - The model documentation report is created in a file named "Untitled"

**Save the file (upload first time only)**

- Save the "Untitled" documentation report
  - PBI VC library: All reports will be published & analyzed in this PBI Workspace, "**HCDW TDD Models**"
  - PBI Report name: All reports for Model Documentation will be named with pre-fix, "**MODEL DOC -** ".
  - Example: **MODEL DOC - VA Time to Hire Dashboard**
- Deploy the new documentation report
  - PBI workspace: All reports will be published & analyzed in this PBI Workspace, "**HCDW TDD Models**"

## Screenshots

Fig1: Running the Model Documenter plugin



C:\Program Files (x86)\Data-Marc\ModelDocumenter\ModelDocumenter.exe

```
Successfully loaded plugin System.Data.OleDb, Version=6.0.0.0, Culture=neutral, PublicKeyToken=cc7b13ffcd2ddd51 from ass
embly System.Data.OleDb.dll
Successfully loaded plugin System.IO.Packaging, Version=6.0.0.0, Culture=neutral, PublicKeyToken=b03f5f7f11d50a3a from a
ssembly System.IO.Packaging.dll
Successfully loaded plugin System.Net.Http, Version=4.0.0.0, Culture=neutral, PublicKeyToken=b03f5f7f11d50a3a from assem
bly System.Net.Http.dll
Successfully loaded plugin System.Net.Http.WebRequest, Version=4.0.0.0, Culture=neutral, PublicKeyToken=b03f5f7f11d50a3a
 from assembly System.Net.Http.WebRequest.dll
Parsing results:
        Command line:
--server localhost:56535 --database d5d09b5d-bb32-4902-933f-c1887d8a66ee --filename c:\Power BI Model Documenter\ModelDo
cumenter.vpax --pbitemplate C:\Program Files (x86)\Common Files\Data-Marc\ModelDocumenter\ModelDocumentationTemplate_v2.
1.0.pbit

        Parsed Arguments:
Argument: s(server), type: String, value: localhost:56535 (converted from: localhost:56535)
Argument: d(database), type: String, value: d5d09b5d-bb32-4902-933f-c1887d8a66ee (converted from: d5d09b5d-bb32-4902-933
f-c1887d8a66ee)
Argument: f(filename), type: String, value: c:\Power BI Model Documenter\ModelDocumenter.vpax (converted from: c:\Power
BI Model Documenter\ModelDocumenter.vpax)
Argument: p(pbitemplate), type: String, value: C:\Program Files (x86)\Common Files\Data-Marc\ModelDocumenter\ModelDocume
ntationTemplate_v2.1.0.pbit (converted from: C:\Program Files (x86)\Common Files\Data-Marc\ModelDocumenter\ModelDocument
ationTemplate_v2.1.0.pbit)

        Arguments not specified:

        Additional arguments:
```

Auto recovery contains some recovered files that haven't been opened.

**Refresh**

Model Metadata
Evaluating...

Tables
Evaluating...

Columns
Evaluating...

_Measures
Evaluating...

Relationships
Evaluating...

Cancel

**Model Documentation - DATA PROFILE - DFAS HR Payroll 2023-P15**

**Power BI Model Documentation**

This Power BI report describes another data model, that was analyzed by using External Tools capabilities in Power BI Desktop.

The Power BI Model Documenter is a plug-in to Power BI that quickly and effectively documents the report data model. Deploying the report to PBI Service makes it easy to share and analyze the data model documentation for collaborating with developers and managers of the data. Creating model documentation is especially important if we want to share the dataset for reuse, or need to review or explain how the data is sourced and calculated in the report.

The approach used to generate this report is described in the HCDW Confluence page at PBI Tools Model Documenter.

Features Summary
- Identify all data sources and connection strings in the report (Redshift, Excel, CSV, manual data, etc.)
- Shows comments/descriptions for Measures, Tables, Columns,
- Security Roles are documented
- Table row counts in the model tables
- Columns analysis (datatype, calculations, cardinality/unique rows)
- View all measures KPI's (calculations, descriptions)
- Copy code scripts to notepad, for review and analyis
- It takes about 5 minutes to Create, Save, and Deploy

**Model information**

| | |
|---|---|
| powerbi://api.powerbigov.us/v1.0/myorg/HCD...<br>Server Name | DATA PROFILE - DFAS HR Payroll 2023-P15<br>Model Name |
| PowerBI<br>Compatibility Mode | 1568<br>Compatibility Level |
| 06.Jul.2023 20:07<br>Model Created | 18.Aug.2023 00:00<br>Last Processed |

**Extraction**

| | |
|---|---|
| ModelDocumenter<br>Extractor App | 2.1<br>Extractor App Version |
| Dax.Model.Extractor<br>Extractor Lib | 24.Oct.2023 13:14<br>Extraction Date |

Fig.2: Analysis Services live connection to existing data model

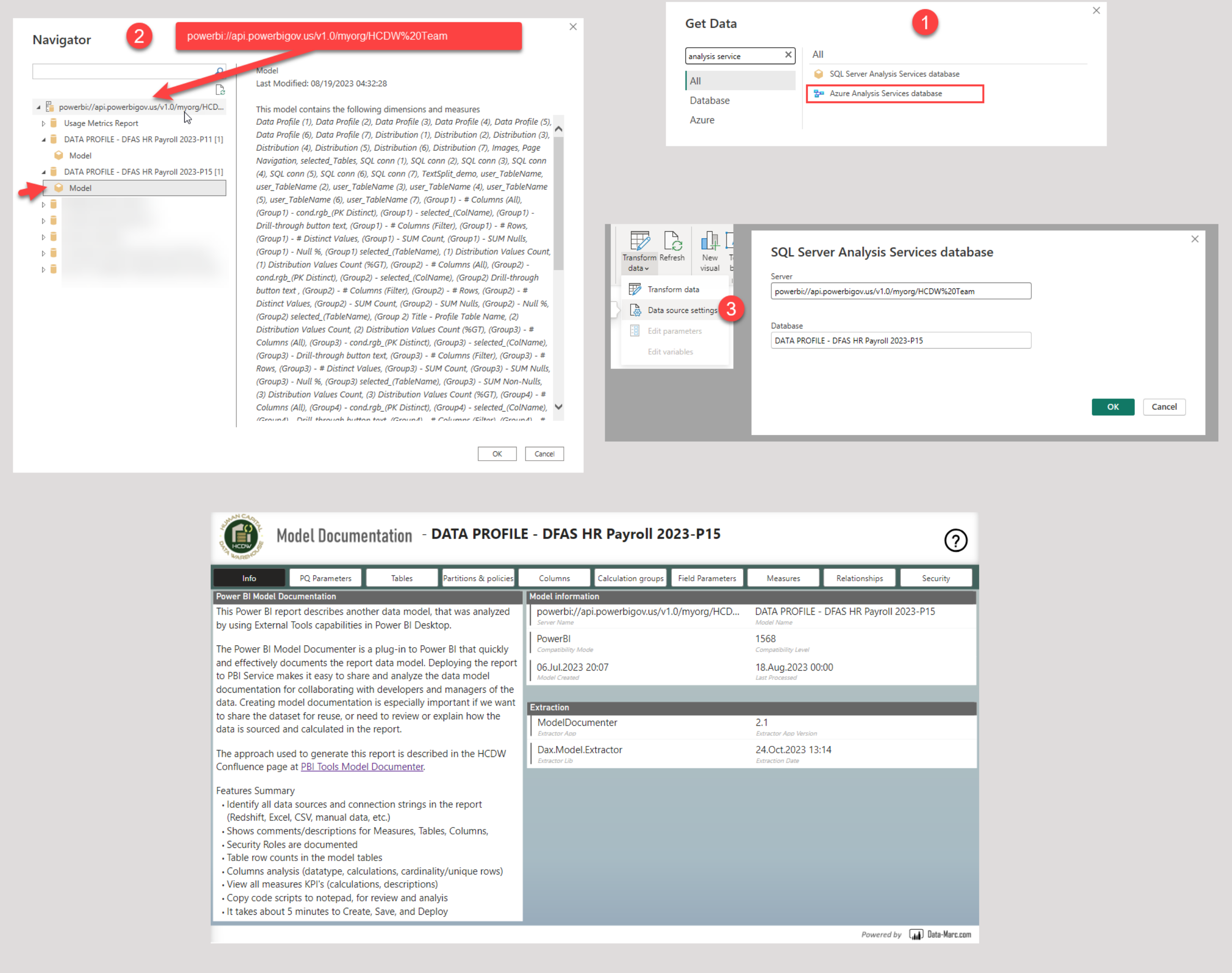
## PBI XMLA endpoints

```
        - HCDW Team
powerbi://api.powerbigov.us/v1.0/myorg/HCDW%20Team

- HCDW TDD Models
powerbi://api.powerbigov.us/v1.0/myorg/HCDW%20TDD%20Models

- HCDW Sandbox
powerbi://api.powerbigov.us/v1.0/myorg/HCDW%20Sandbox

- HCDW Payroll [TEST]
powerbi://api.powerbigov.us/v1.0/myorg/HCDW%20Payroll%20%5BTEST%5D
```



Navigator
2
powerbi://api.powerbigov.us/v1.0/myorg/HCDW%20Team
powerbi://api.powerbigov.us/v1.0/myorg/HCD...
Usage Metrics Report
DATA PROFILE - DFAS HR Payroll 2023-P11 [1]
Model
DATA PROFILE - DFAS HR Payroll 2023-P15 [1]
Model
OK
Cancel

Model
Last Modified: 08/19/2023 04:32:28

This model contains the following dimensions and measures
*Data Profile (1), Data Profile (2), Data Profile (3), Data Profile (4), Data Profile (5), Data Profile (6), Data Profile (7), Distribution (1), Distribution (2), Distribution (3), Distribution (4), Distribution (5), Distribution (6), Distribution (7), Images, Page Navigation, selected_Tables, SQL conn (1), SQL conn (2), SQL conn (3), SQL conn (4), SQL conn (5), SQL conn (6), SQL conn (7), TextSplit_demo, user_TableName, user_TableName (2), user_TableName (3), user_TableName (4), user_TableName (5), user_TableName (6), user_TableName (7), (Group1) - # Columns (All), (Group1) - cond.rgb_(PK Distinct), (Group1) - selected_(ColName), (Group1) - Drill-through button text, (Group1) - # Columns (Filter), (Group1) - # Rows, (Group1) - # Distinct Values, (Group1) - SUM Count, (Group1) - SUM Nulls, (Group1) - Null %, (Group1) selected_(TableName), (1) Distribution Values Count, (1) Distribution Values Count (%GT), (Group2) - # Columns (All), (Group2) - cond.rgb_(PK Distinct), (Group2) - selected_(ColName), (Group2) Drill-through button text , (Group2) - # Columns (Filter), (Group2) - # Rows, (Group2) - # Distinct Values, (Group2) - SUM Count, (Group2) - SUM Nulls, (Group2) - Null %, (Group2) selected_(TableName), (Group 2) Title - Profile Table Name, (2) Distribution Values Count, (2) Distribution Values Count (%GT), (Group3) - # Columns (All), (Group3) - cond.rgb_(PK Distinct), (Group3) - selected_(ColName), (Group3) - Drill-through button text, (Group3) - # Columns (Filter), (Group3) - # Rows, (Group3) - # Distinct Values, (Group3) - SUM Count, (Group3) - SUM Nulls, (Group3) - Null %, (Group3) selected_(TableName), (Group3) - SUM Non-Nulls, (3) Distribution Values Count, (3) Distribution Values Count (%GT), (Group4) - # Columns (All), (Group4) - cond.rgb_(PK Distinct), (Group4) - selected_(ColName),*

SQL Server Analysis Services database

Server
powerbi://api.powerbigov.us/v1.0/myorg/HCDW%20Team

Database
DATA PROFILE - DFAS HR Payroll 2023-P15

Model Documentation - DATA PROFILE - DFAS HR Payroll 2023-P15

**Power BI Model Documentation**

This Power BI report describes another data model, that was analyzed by using External Tools capabilities in Power BI Desktop.

The Power BI Model Documenter is a plug-in to Power BI that quickly and effectively documents the report data model. Deploying the report to PBI Service makes it easy to share and analyze the data model documentation for collaborating with developers and managers of the data. Creating model documentation is especially important if we want to share the dataset for reuse, or need to review or explain how the data is sourced and calculated in the report.

The approach used to generate this report is described in the HCDW Confluence page at PBI Tools Model Documenter.

Features Summary
- Identify all data sources and connection strings in the report (Redshift, Excel, CSV, manual data, etc.)
- Shows comments/descriptions for Measures, Tables, Columns,
- Security Roles are documented
- Table row counts in the model tables
- Columns analysis (datatype, calculations, cardinality/unique rows)
- View all measures KPI's (calculations, descriptions)
- Copy code scripts to notepad, for review and analyis
- It takes about 5 minutes to Create, Save, and Deploy

**Model information**

| | |
|---|---|
| powerbi://api.powerbigov.us/v1.0/myorg/HCD...<br>*Server Name* | DATA PROFILE - DFAS HR Payroll 2023-P15<br>*Model Name* |
| PowerBI<br>*Compatibility Mode* | 1568<br>*Compatibility Level* |
| 06.Jul.2023 20:07<br>*Model Created* | 18.Aug.2023 00:00<br>*Last Processed* |

**Extraction**

| | |
|---|---|
| ModelDocumenter<br>*Extractor App* | 2.1<br>*Extractor App Version* |
| Dax.Model.Extractor<br>*Extractor Lib* | 24.Oct.2023 13:14<br>*Extraction Date* |

# MODEL DOC - INSTALLATION

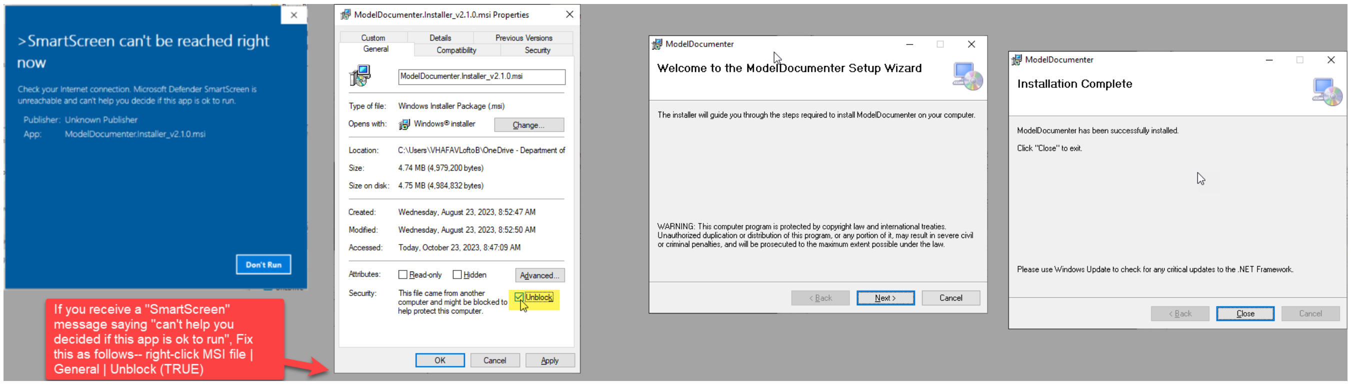
Installation is very simple.

1. Run the installer
2. Updates 2 files using VA HCDW customizations

## A) Run the installer

Below is the installer link, and are screenshots for running the MSI.

| Link | Source | Description |
|---|---|---|
| ModelDocumenter.Installer_v2.1.0 | [Doc Library] SharePoint: HCDW PBI Reports \| HCDW PBI Tools - Installs | HCDW Team installs folder, installers for approved tools. |



>SmartScreen can't be reached right now

Check your Internet connection. Microsoft Defender SmartScreen is unreachable and can't help you decide if this app is ok to run.

Publisher: Unknown Publisher
App: ModelDocumenter.Installer_v2.1.0.msi

ModelDocumenter.Installer_v2.1.0.msi Properties

ModelDocumenter.Installer_v2.1.0.msi

Type of file: Windows Installer Package (.msi)
Opens with: Windows® installer
Location: C:\Users\VHAFAVLoftoB\OneDrive - Department of
Size: 4.74 MB (4,979,200 bytes)
Size on disk: 4.75 MB (4,984,832 bytes)
Created: Wednesday, August 23, 2023, 8:52:47 AM
Modified: Wednesday, August 23, 2023, 8:52:50 AM
Accessed: Today, October 23, 2023, 8:47:09 AM
Attributes: □ Read-only □ Hidden
Security: This file came from another computer and might be blocked to help protect this computer. ☑ Unblock

If you receive a "SmartScreen" message saying "can't help you decided if this app is ok to run", Fix this as follows-- right-click MSI file | General | Unblock (TRUE)

ModelDocumenter

Welcome to the ModelDocumenter Setup Wizard

The installer will guide you through the steps required to install ModelDocumenter on your computer.

WARNING: This computer program is protected by copyright law and international treaties. Unauthorized duplication or distribution of this program, or any portion of it, may result in severe civil or criminal penalties, and will be prosecuted to the maximum extent possible under the law.

ModelDocumenter

Installation Complete

ModelDocumenter has been successfully installed.

Click "Close" to exit.

Please use Windows Update to check for any critical updates to the .NET Framework.

---

## B) Update 2 files using VA HCDW customizations

Both files to copy are located in PBI VC document library. To update the files you must enter EP account credentials.

**Source Files Directory:**

```
        C:\Users\%username%\Department of Veterans Affairs\Power BI Reports Site - VC HCDW TDD
Models\Published Reports
```

Copy File:

***ModelDocumentationTemplate_v2.1.0_(VAHCDW).pbit***

- The changes made give us custom visuals and insights created for our team

**Target Directory**

```
         C:\Program Files (x86)\Common Files\Data-Marc\ModelDocumenter
```

Copy File:

***Data-Marc_ModelDocumenter_v2.1.0.pbitool.json***

- The changes made tells the PBI plugin to use the "VAHCDW" template file, instead of the default template file

**Target Directory**

```
        C:\Program Files (x86)\Common Files\microsoft shared\Power BI Desktop\External Tools
```

---

# CUSTOMIZATION

## Tables Source Connection

Two calculations are added, for extracting the "DB/File" and the "Source Connection" information from the query expression. Examples included below.

- DB/File:
  - hcd-dev-redshiftcluster.czcd1vi5pnl6.us-gov-west-1.redshift.amazonaws.com:5439
  - https://dvagov.sharepoint.com/sites/oithcdwpbireports
- Source Connection:
  - AWS: "hcd-dev-db"."datawarehouse"."dimgpracctg"
  - SPxlsx: PBI Data Upload/HCDW Team/DFAS Type Codes.xlsx""

**M expression: DF/File and Source Connection**

```
            fnDBFile = Table.AddColumn(Source, "DB/File",
        each
        let M_expression = () => [Column1] in
        // AWS REDSHIFT
        let AwsRed_Conn = () => Text.BetweenDelimiters( M_expression(), "AmazonRedshift.Database(", ")" ) in
        let AwsRed_Db = () => Text.AfterDelimiter(AwsRed_Conn(), ",") in
        let AwsRed_Schema = () => Text.BetweenDelimiters( M_expression(), "Source{[Name=", "]" ) in
        let AwsRed_Table = () => Text.BetweenDelimiters( M_expression(), "mySchema{[Name=", "]" ) in
        let calc_AwsRed = () => Text.Combine( List.Select({AwsRed_Db(), AwsRed_Schema(), AwsRed_Table()},
each _<> "" and _ <> null),  ".") in
        let print_AwsRed = () => if (calc_AwsRed() = "") then null else "AWS: "& calc_AwsRed() in
        // SHAREPOINT FILES
        let SharePoint_Conn = () => Text.BetweenDelimiters( M_expression(), "Web.Contents(", ")" ) in
        let SP_filename = () => Text.Replace(Text.AfterDelimiter(SharePoint_Conn(), "/", {2,
RelativePosition.FromEnd}), "%20", " ") in
        let SP_type = () => Text.Select(Text.AfterDelimiter(SharePoint_Conn(), ".", {0, RelativePosition.
FromEnd}), {"a".."z","A".."Z"}) in
        let print_SharePoint = () => if (SP_filename() = "") then null else "SP"& SP_type() & ": "&
SP_filename() in
        //// Final
        print_AwsRed() ?? print_SharePoint()
        //print_AwsRed()
        //SP_type()
        ),
    fn_SourceConn = Table.AddColumn(fnDBFile, "Source Connection",
        each
        let M_expression = () => [Column1] in
        // AWS REDSHIFT
        let AwsRed_Conn = () => Text.BetweenDelimiters( M_expression(), "AmazonRedshift.Database(", ")" ) in
        let AwsRed_Conn2 = () => Text.BeforeDelimiter( AwsRed_Conn(), "," ) in
        let AwsRed_Conn3 = () => Text.Select( AwsRed_Conn2(), {"1".."9","a".."z","A".."Z",":","/",".","-"})
in
        let print_AwsRed = () => if (AwsRed_Conn() = "") then null else AwsRed_Conn3() in
        // SHAREPOINT FILES
        let SharePoint_Conn = () => Text.BetweenDelimiters( M_expression(), "Web.Contents(", ")" ) in
        let SharePoint_Conn2 = () => Text.BeforeDelimiter( SharePoint_Conn(), "/", 4 ) in
        let SharePoint_Conn3 = () => Text.Select( SharePoint_Conn2(), {"a".."z","A".."Z",":","/",".","-"}) in
        let print_SharePoint = () => if (SharePoint_Conn2() = "") then null else SharePoint_Conn3() in
        //// Final
        print_AwsRed() ?? print_SharePoint()
        //print_AwsRed()
        //SP_type()
        ),
```

## APPENDIX