Power Platform App in a Day

Supplemental Module 1: Power BI

Hands-on Lab Step-by-Step

May 2020

Contents

Power BI

Lab Prerequisites

This is an optional addition to the App in a Day series, covering Power Apps, Common Data Service, Power Automate and Power BI. The assumption is that you have successfully completed the first four modules, or at least the initial part of setting up an environment as described in the overview – "**00-AppInADay Lab Overview.pdf**".

If you have not completed the previous modules, you can use the completed version of the lab package in the "\Completed\Module4\Completed Solution" folder. Follow the instructions in the document "Complete Solution" before proceeding with this module, which will provision the app and the Common Data Service entity into your environment.

About Power BI

Power BI is a suite of business analytics tools that deliver insights throughout your organization. In this lab, we will be using Power BI to visualize data from the device procurement process. Power BI can connect to hundreds of data sources and prepare the data for use. In this lab, you will be using the Common Data Service and the Excel connectors.

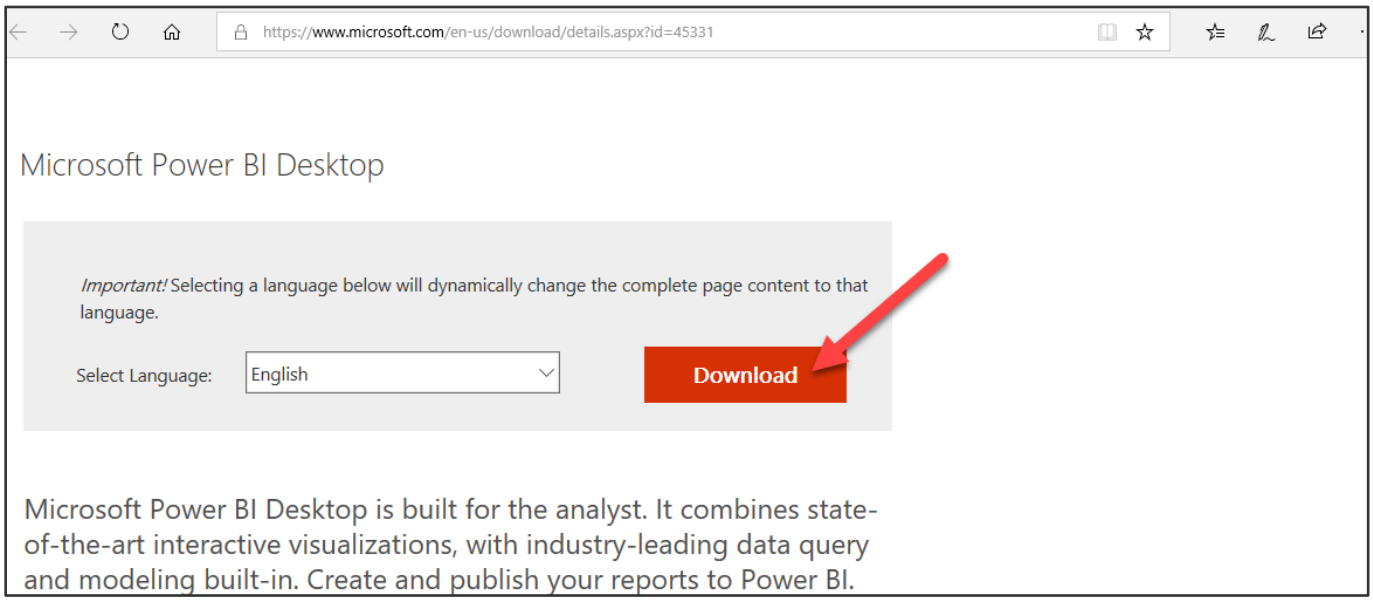
Exercise 1: Install Power BI Desktop

In this exercise you will install the Power BI Desktop application. **If you already have the application installed, you may skip to Exercise 2.**

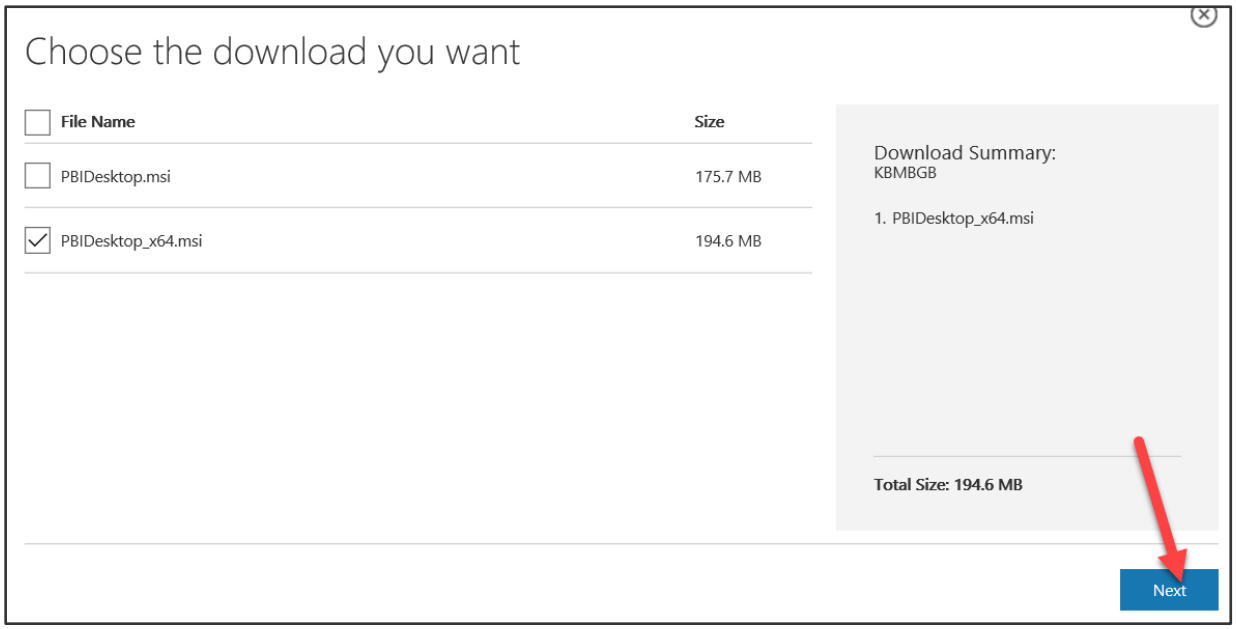
Task 1: Download and install Power BI Desktop

In this task, you will download and install Power BI Desktop.

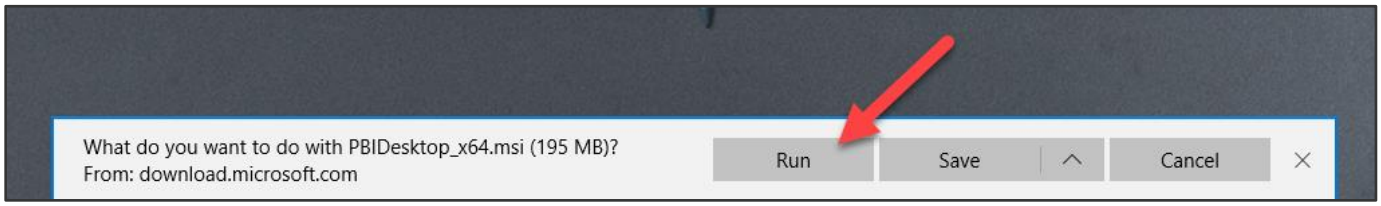
1. Navigate to Power BI Installer and click Download.



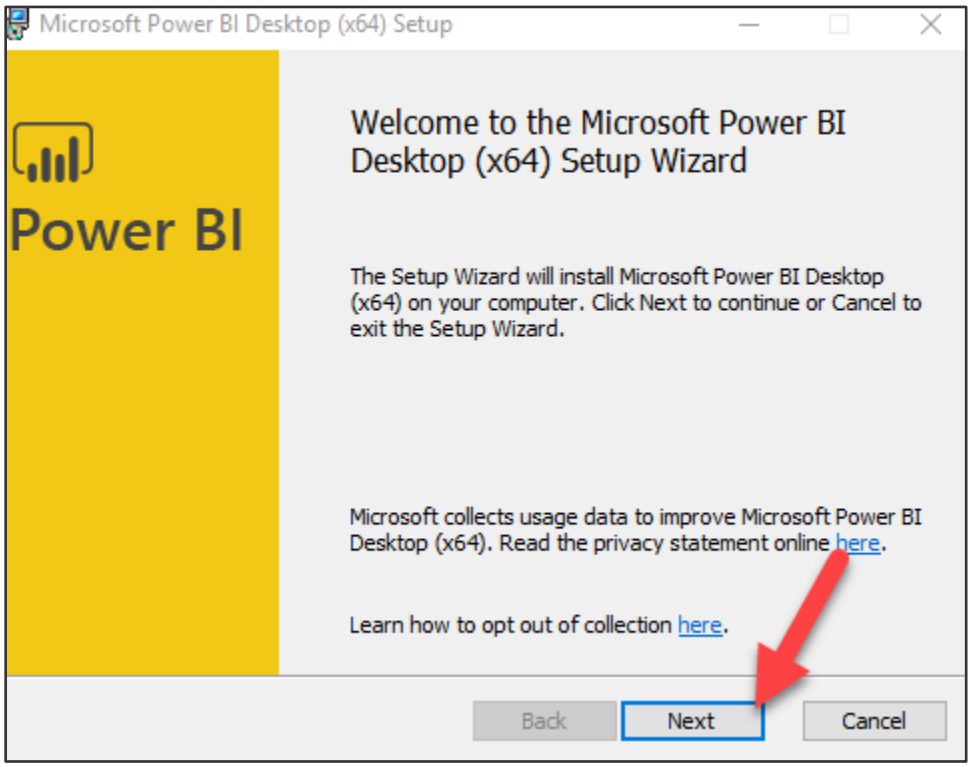
2. Select the appropriate version for your computer and click Next.



3. Click Run.



4. Click Next.



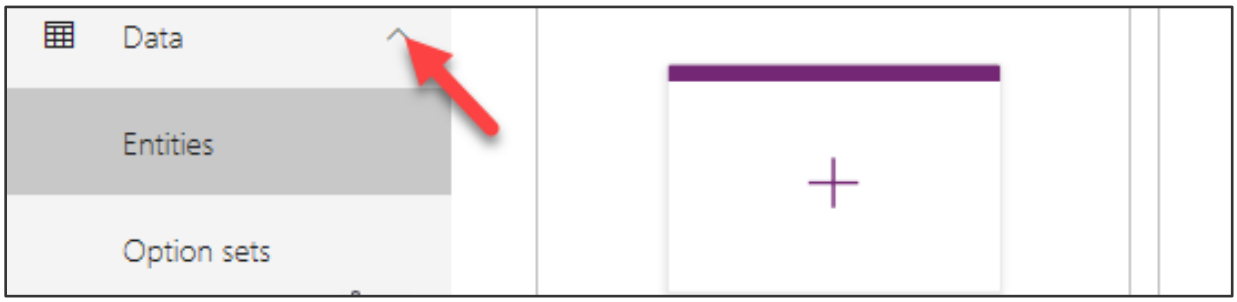
5. Follow the installation wizard and complete the installation.

Exercise 2: Import historical data

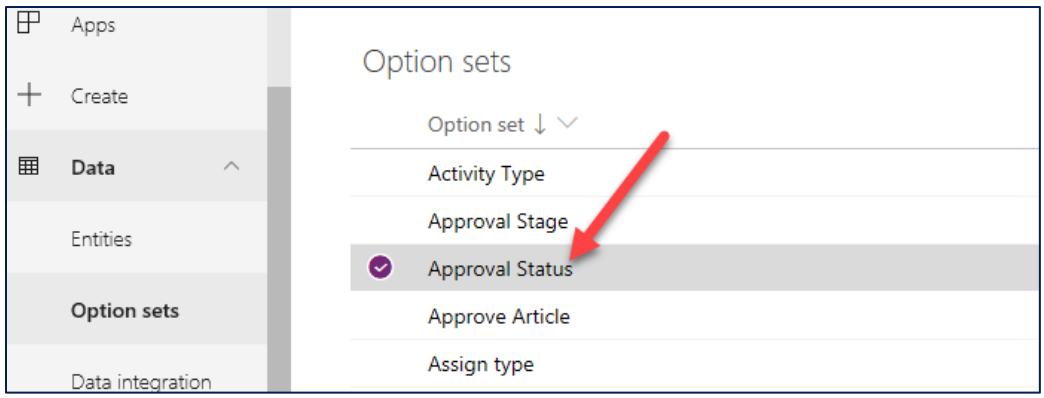
Task 1: Import past orders into Common Data Service

Since you probably only input four or five device orders when testing the PowerApp you built in the prior modules we need more test data to report on. To make the Power BI Analytics more interesting we need some additional data. In this task you will be importing some historical orders into the CDS Device Orders entity.

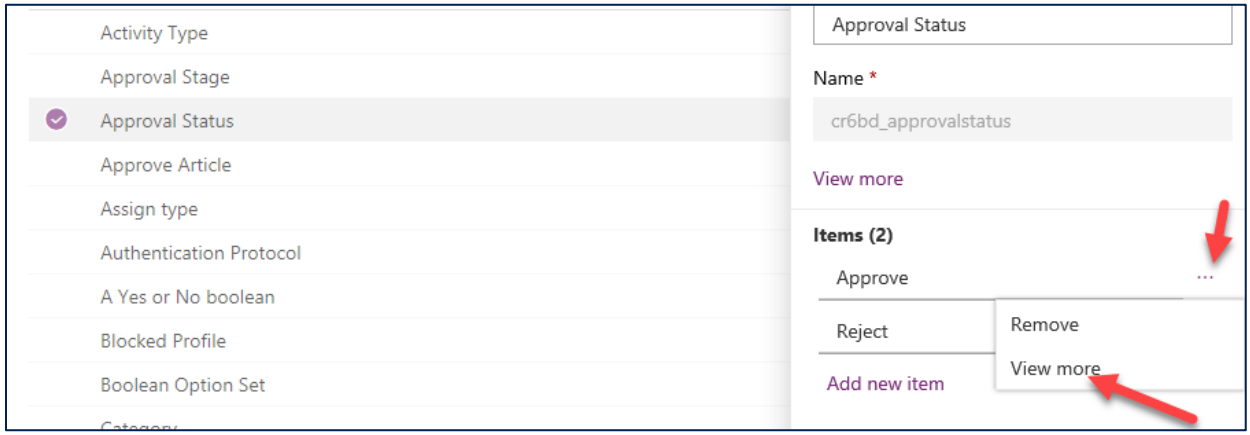
1. From Make Power Apps log in to your existing Power Apps Environment that has your CDS data that you have used for the prior labs. Select your environment and expand **Data**.



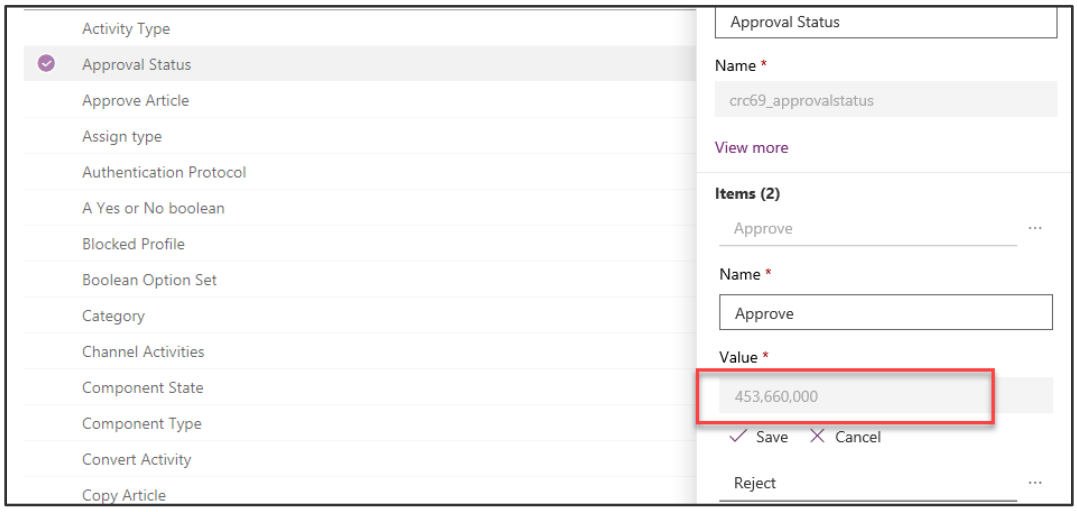
2. Select **Option Sets** and click on the **Approval Status**.



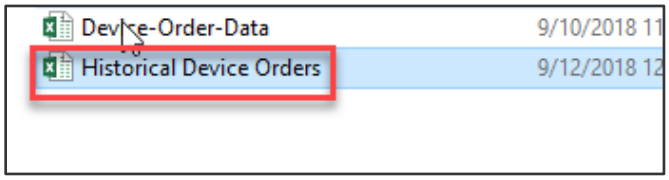
3. Click the … button of the **Approve** option and select View More.



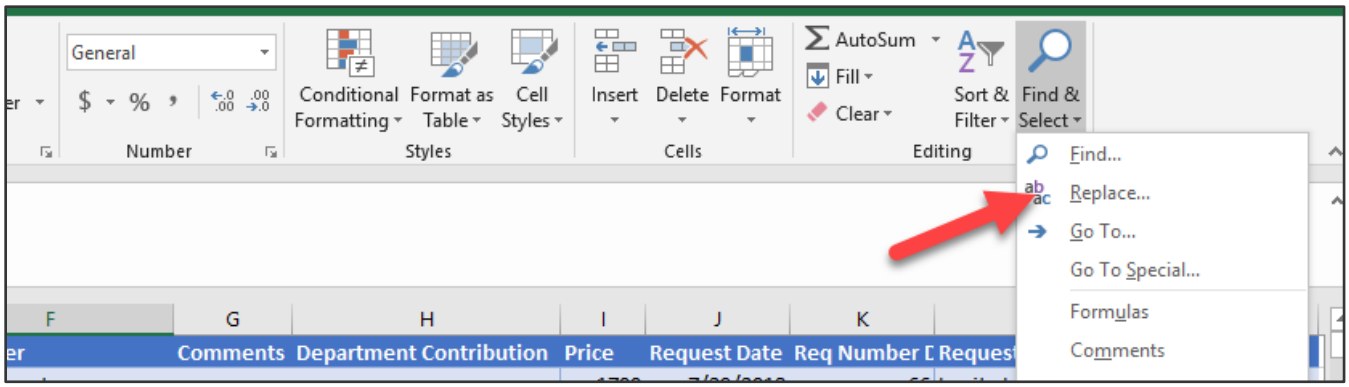
4. Copy the Value.



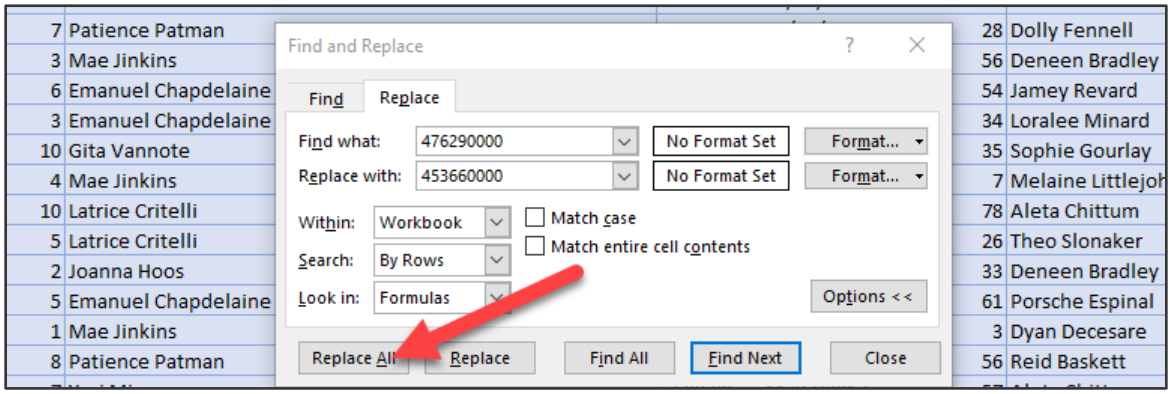
5. Go to the resources folder of the module and open the Historical Device Order Excel file



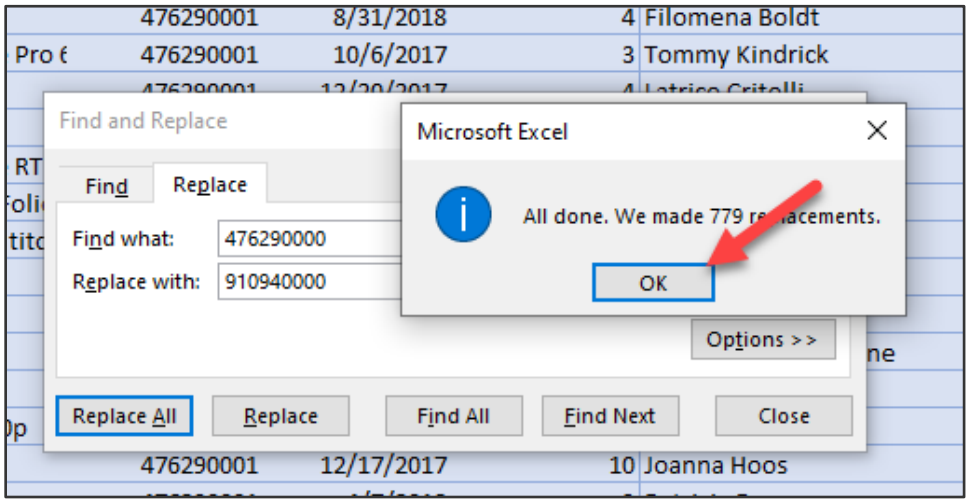
6. Click Find and select Replace.



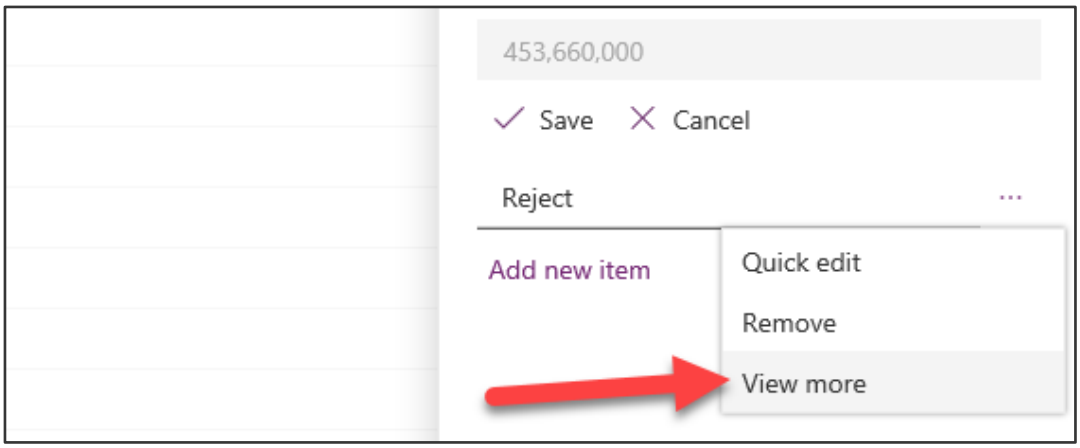
7. Enter 476290000 for Find, type the Value you copied (without the commas) in the Replace field, and click Replace All.



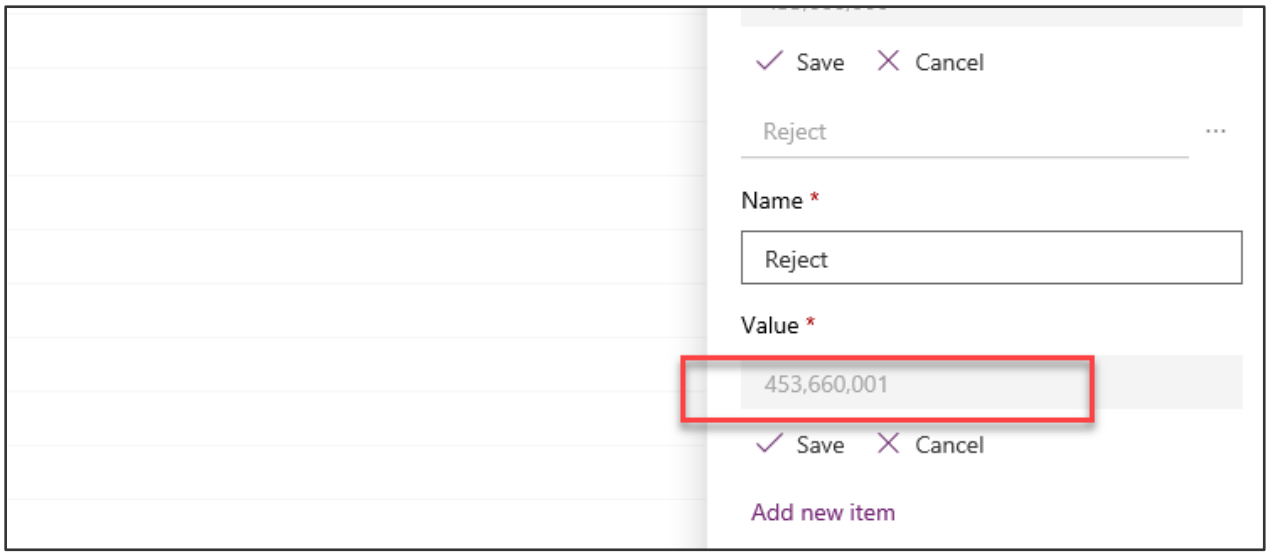
8. Click OK.



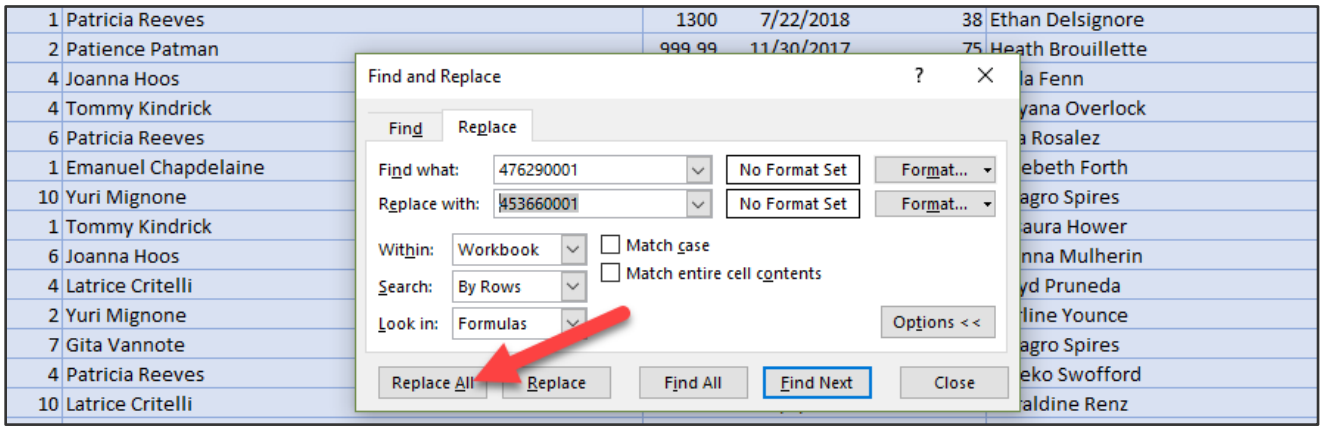
9. Go back to Power Apps, click on the ellipses button of the Reject option, and select View More.



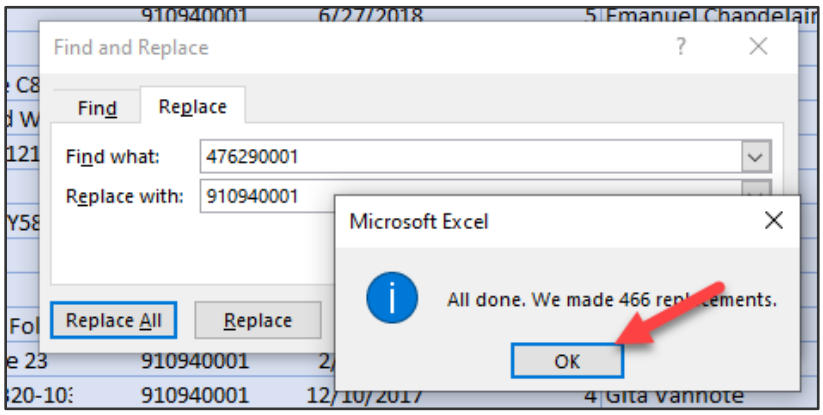
10. Copy the Value again.



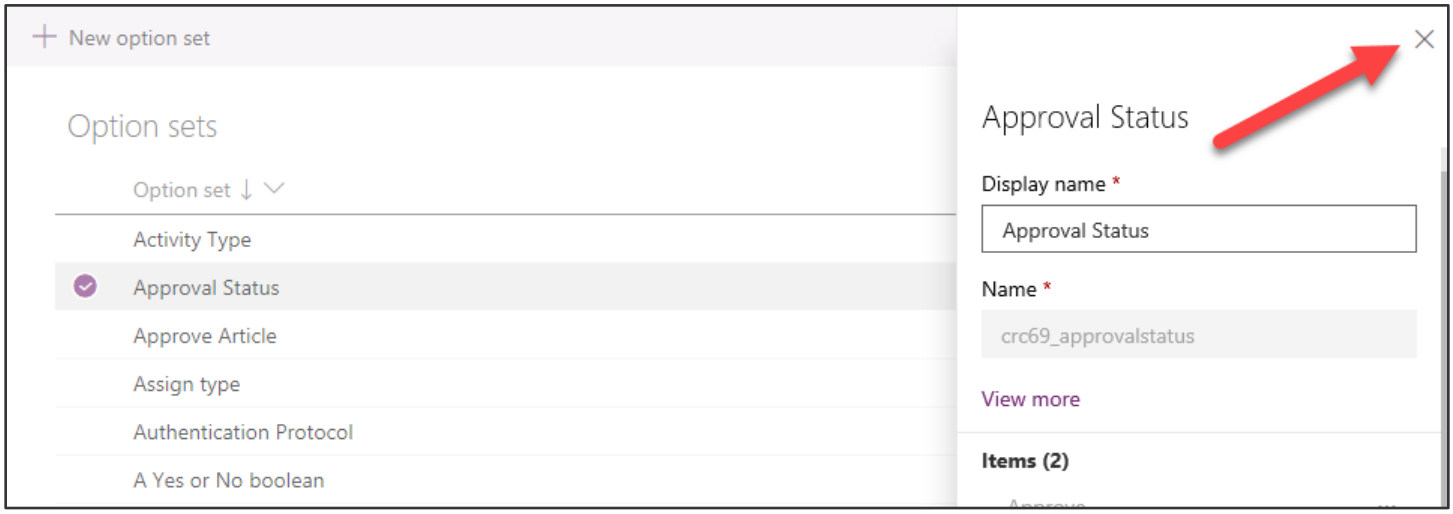
11. Go back to the Excel file, type 476290001 on the find filed, the value you copied (without the commas) in the replace field, and click Replace All.



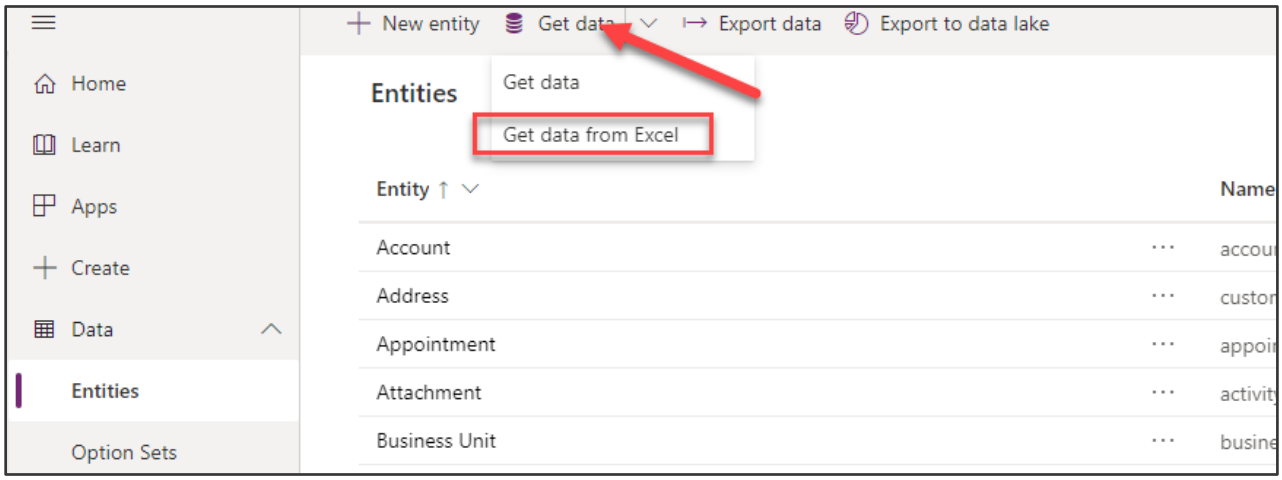
12. Click Ok.



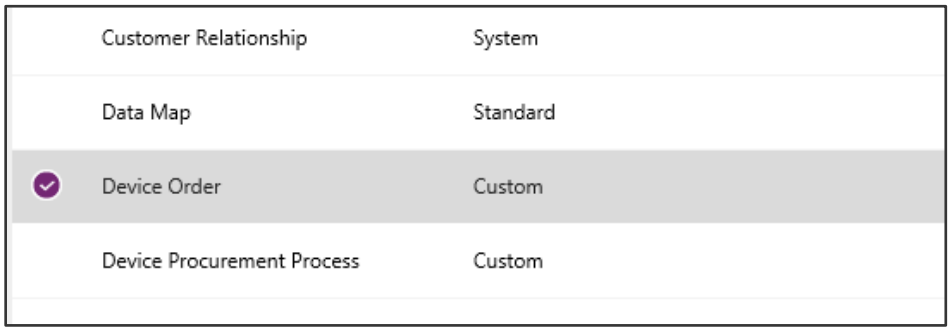
13. Close the Find and Replace dialog.
14. Save the Excel file and close it.
    Note: The reason we are doing this is due to each environment having a unique publisher prefix, when you created your solution the values of the option set are prefixed based on that value. Currently the import process we are going to use requires the numeric value and not the label value so it must be adjusted.
15. Go back to the Power Apps and close the Option Set edit window.



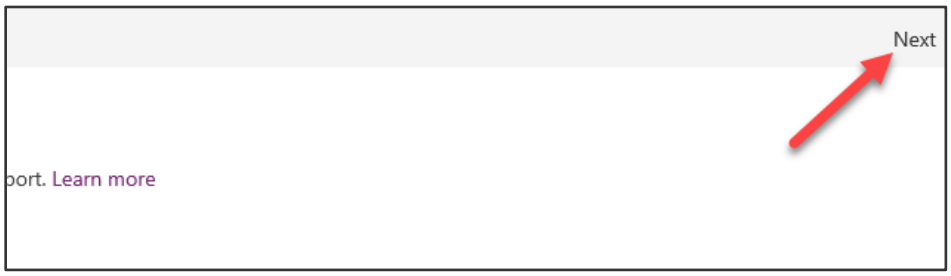
16. There are many options available to get data into CDS. We are going to import from an Excel file. Select **Entities** click **Get Data** and select **Get Data from Excel**.



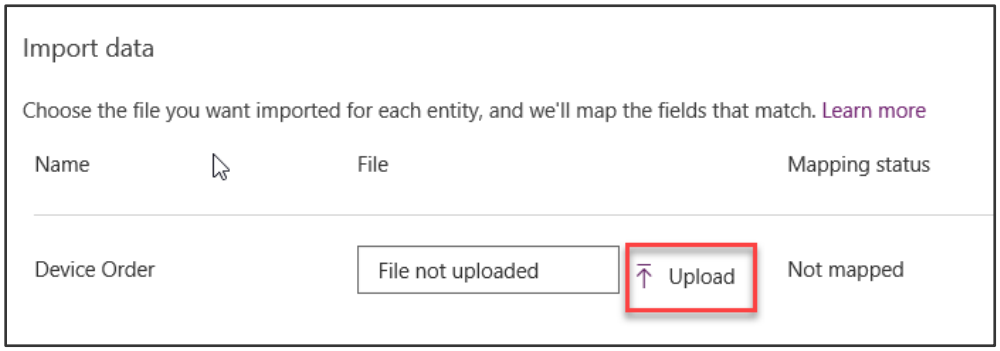
17. Scroll down the list of entities and choose **Device Order**



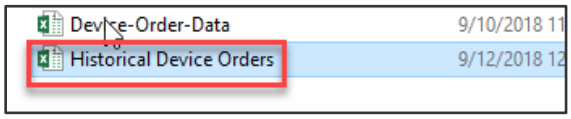
18. Scroll back up and in the upper right corner click **Next**



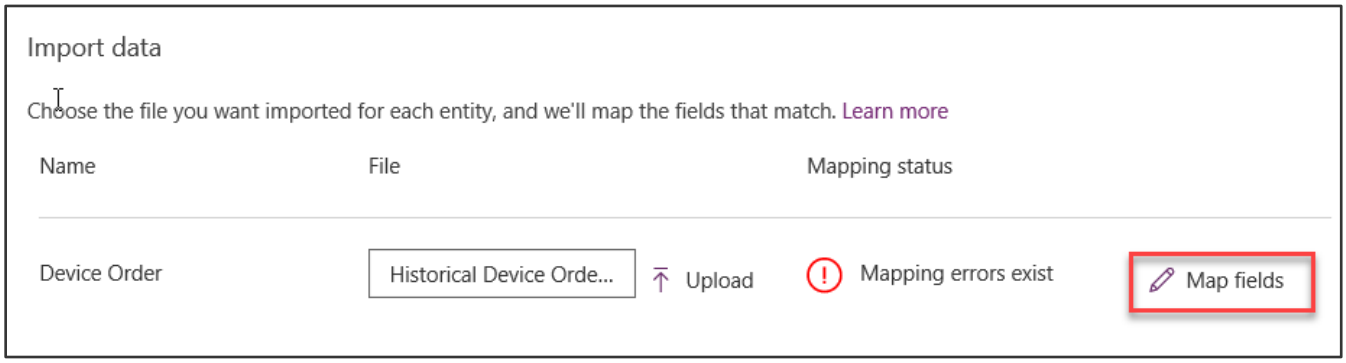
19. Click Upload to open the file browser



20. Select the Historical Device Orders Excel file.



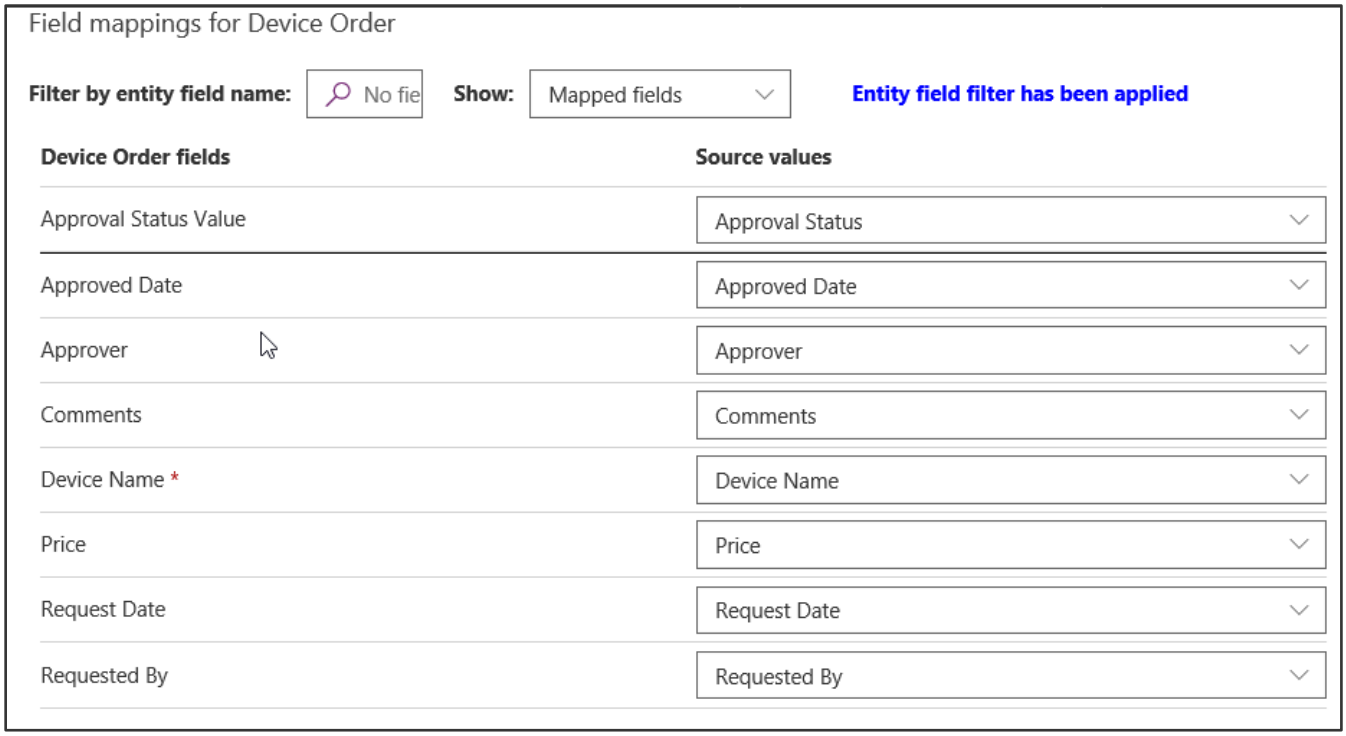
21. After the file upload is complete it will show mapping errors, Click **Map fields**



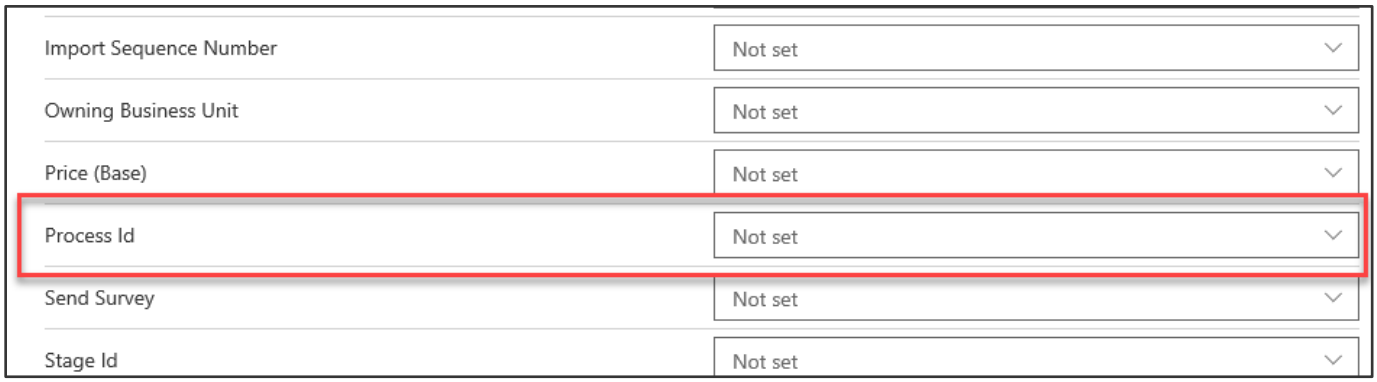
22. Map the following fields

Device Order fields	**Source values**
Approval Status Value	Approval Status
Approved Date	Approved Date
Approver	Approver
Comments	Comments
Device Name	Device Name
Price	Price
Process ID	Select None to un map
Request Date	Request Date
Requested By	Requested By

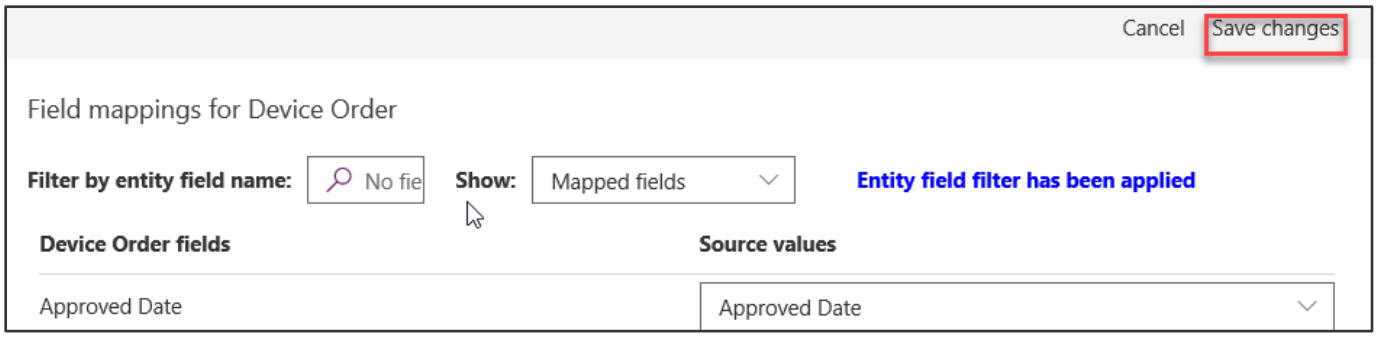
23. Change the Show: dropdown to Mapped fields to show only the fields you have mapped. Confirm your list matches the list show in the image.



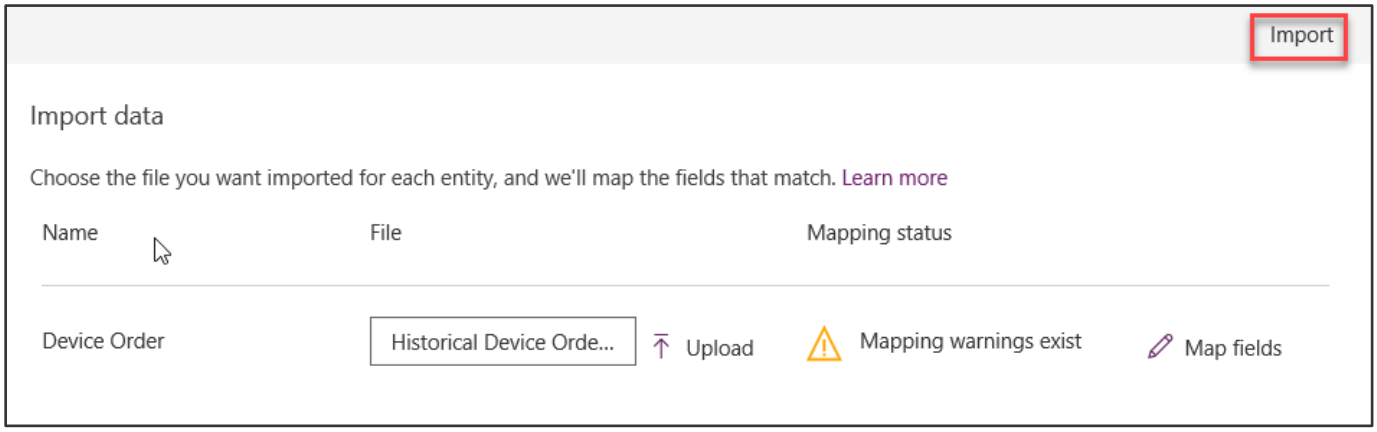
24. Confirm that Process Id is NOT mapped to Approved Date, if it is then un map it by selecting None.



25. Click **Save changes** to proceed. You may still have an Error and a Warning that is ok

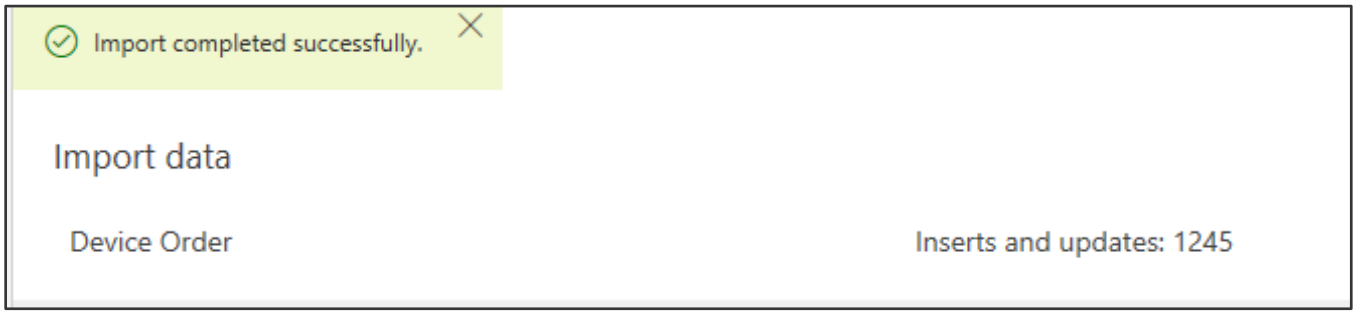


26. Click Import to begin the import of the historical data



27. This should take a couple of minutes to complete – while processing you should see the following

28. Once the import has completed you should see the following



29. If for some reason the import wasn't successful, download the log file and review. Most common cause is an improper mapping of a field type. If that happens just start this task again as it doesn't retain your mappings.

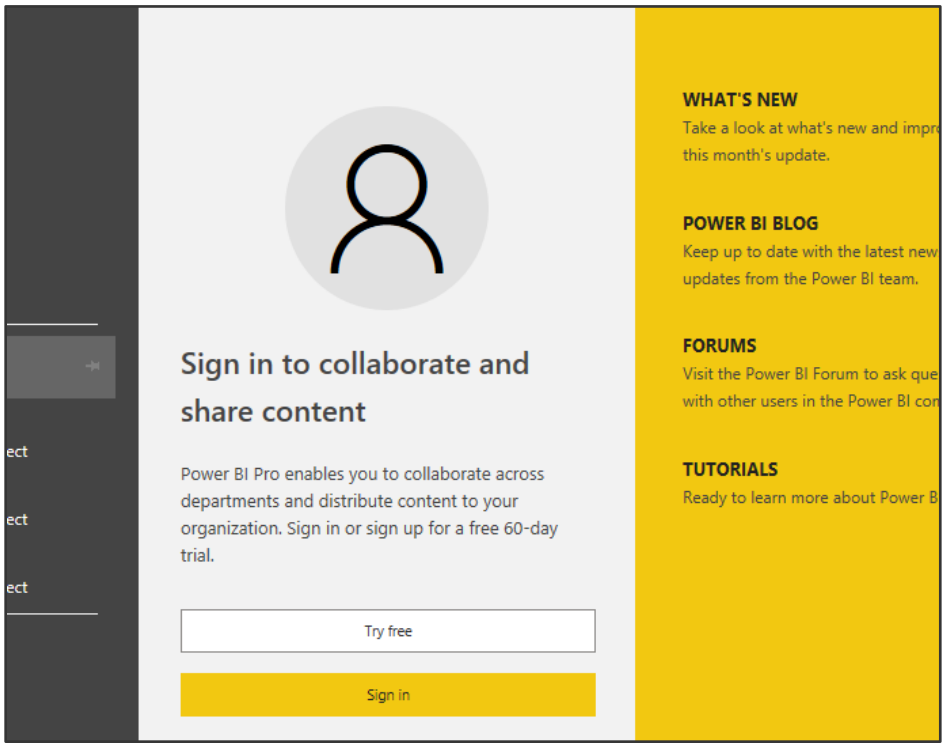
Exercise 3: Connect and reference data

In this exercise, you will connect to the Common Data Service using a connector. You will then be referencing the data from the device procurement process that you will use to build the visualizations. This includes selecting only the data that is useful to help have a easy to use data set to work with.

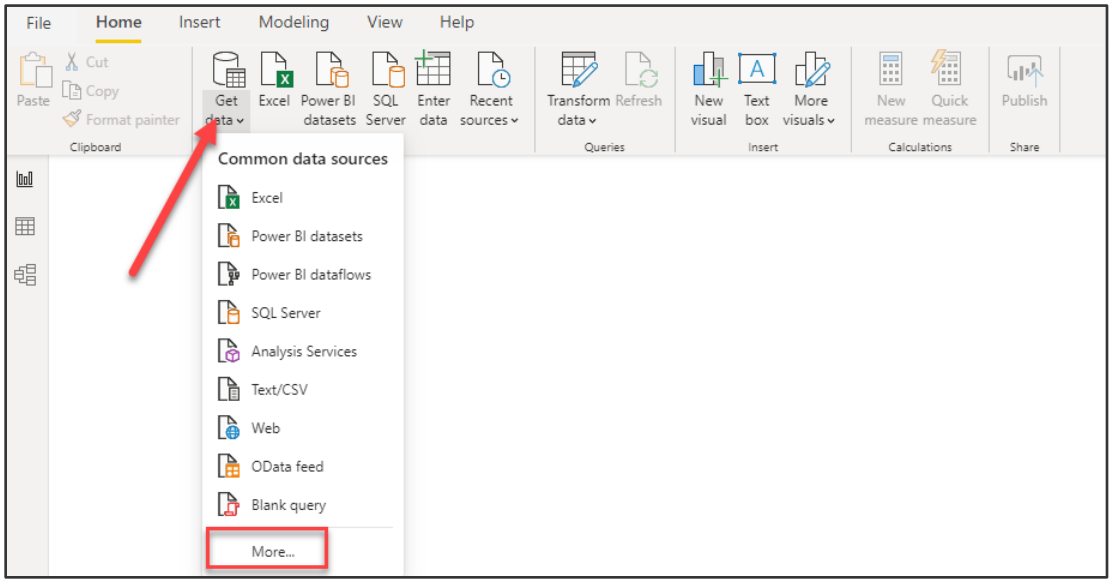
Task 1: Connect Power BI to the CDS Data

In this task, you will get data from your Common Data Service.

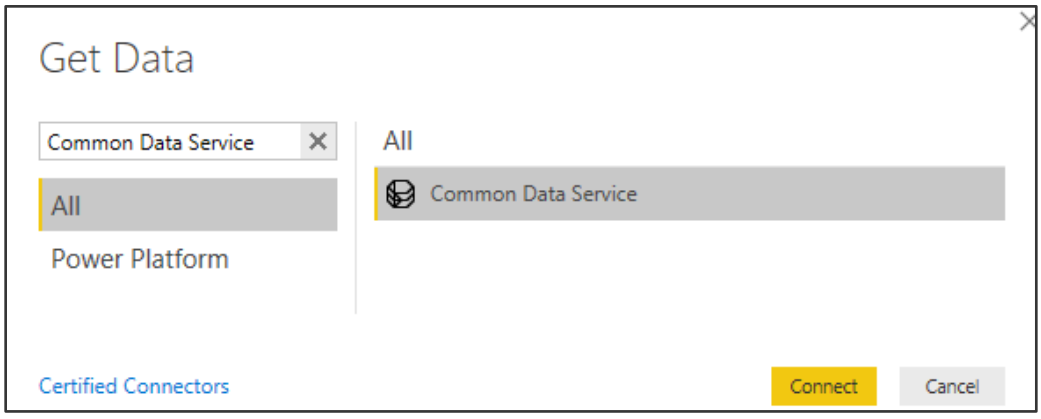
1. Start Power BI Desktop application and click Sign in.



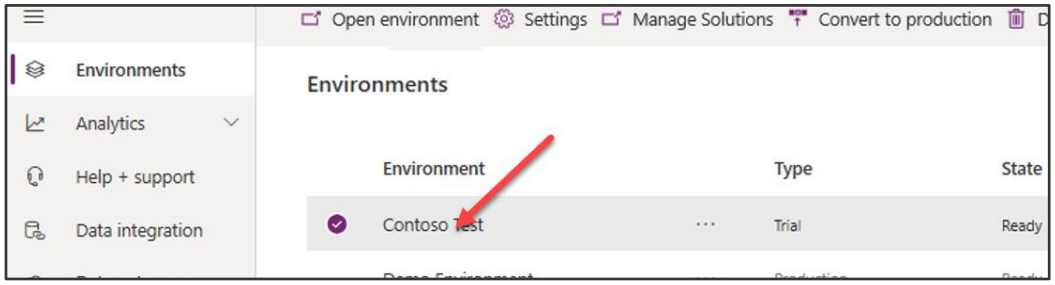
2. Provide your credentials and sign in.
3. Click Get Data and select More…



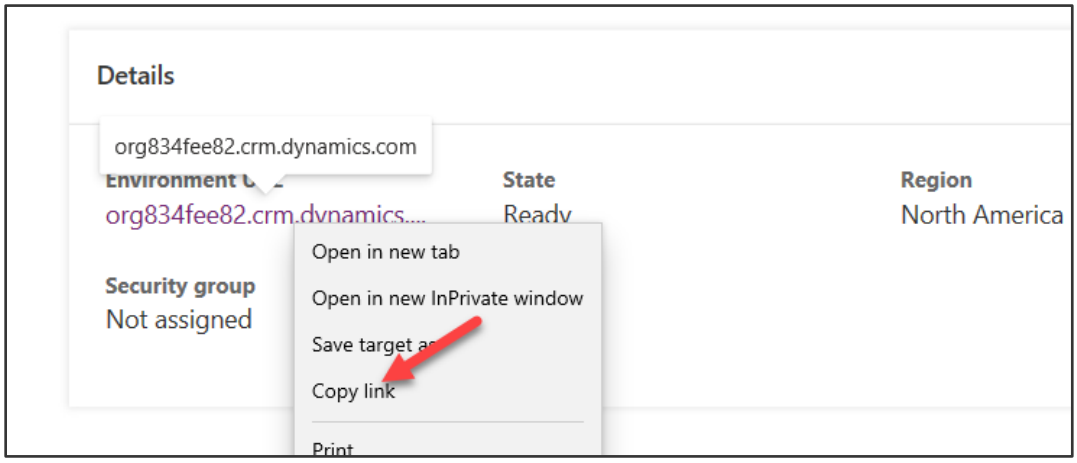
4. Search for **Common Data Service**, select it, and click **Connect**.



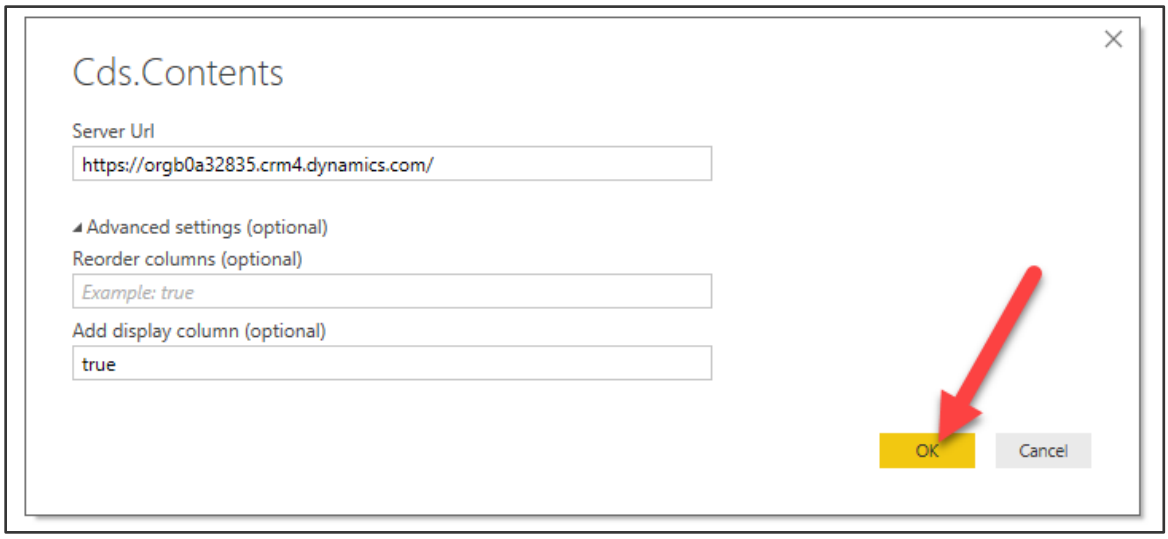
5. Navigate to Admin Power Platform and select Environments.
6. Click to open your environment.



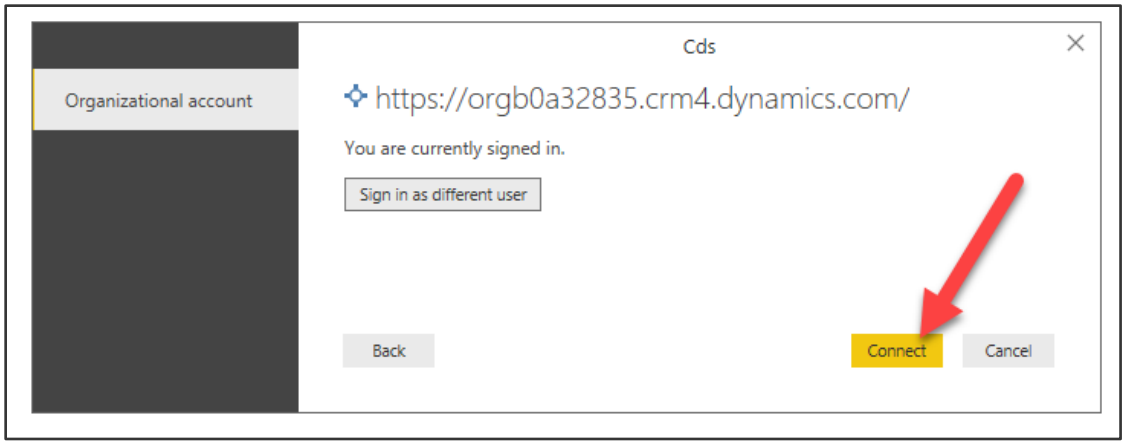
7. Right click on the **URL** and copy the link



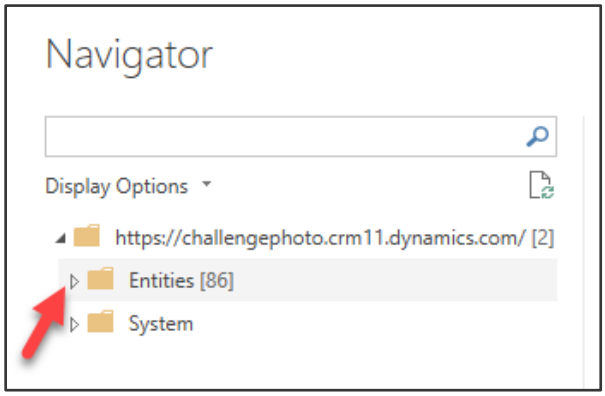
8. Go back to Power BI Desktop, paste the **URL** you copied into the **Server URL** field, type **true** in the **Add Display Column** field, and click **OK**.



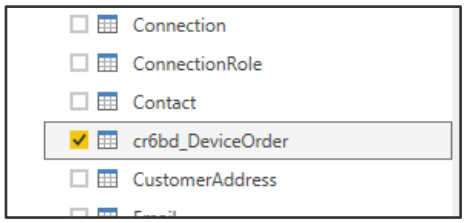
9. If you are prompted to sign in, click Sign in and provide your credentials.
10. Click **Connect**.

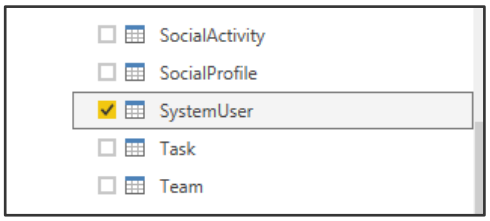


11. Expand **Entities**.

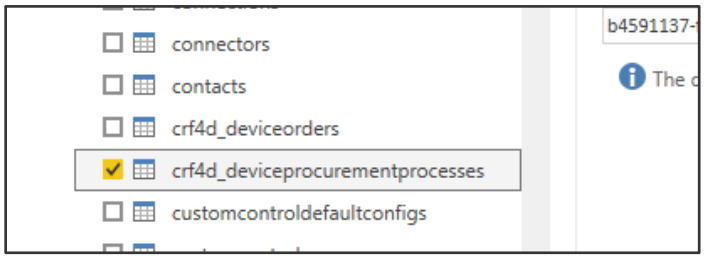


12. Select **_DeviceOrder** and **SystemUser** Note: it will be in the format of <prefix>_DeviceOrder where the prefix will be different in each environment.

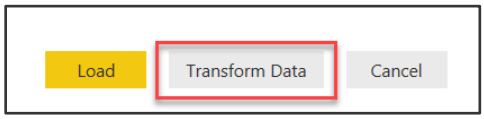




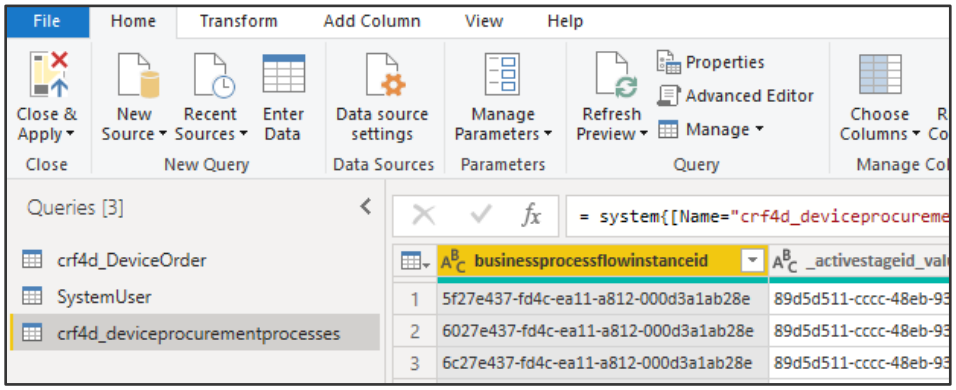
13. Expand **System** and select **new_DeviceProcurementProcesses**.



14. Click **Transform Data**

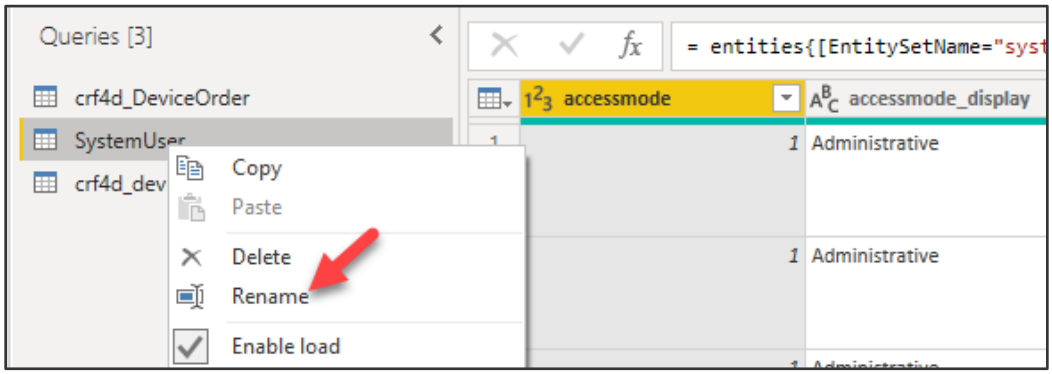


15. Your data will now be available in the Power Query Editor.

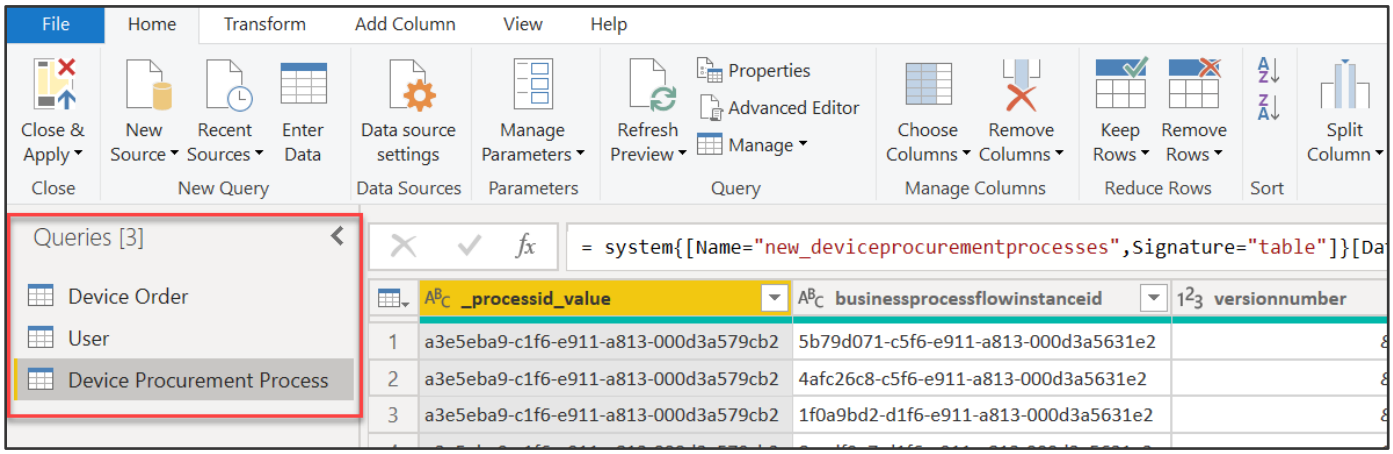


Task 2: Clean up and Transform

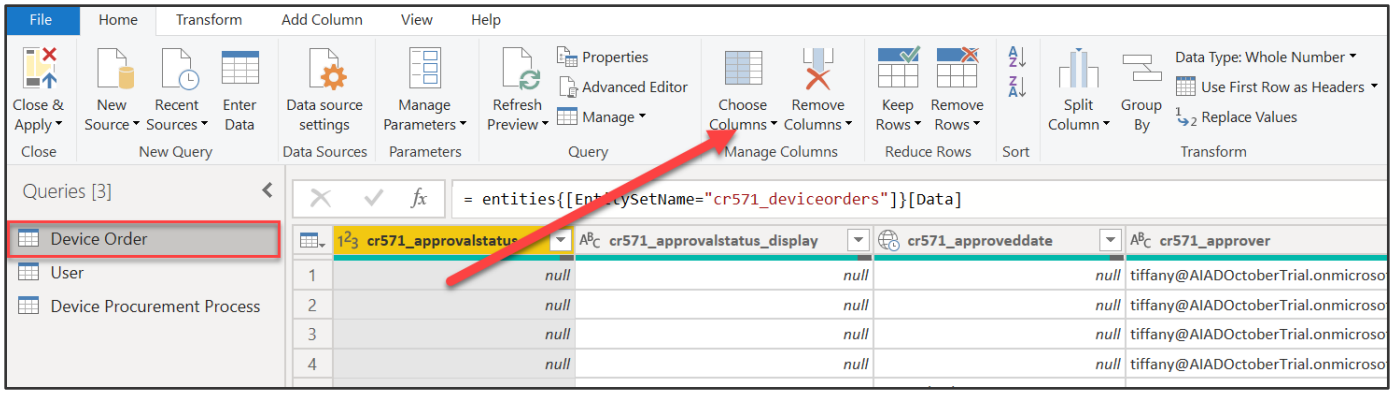
1. Right click on the **System User** table and click **Rename**.



2. Rename the table from **SystemUser** to **User**.
3. Rename the **DeviceOrder** table to **Device Order** and the **DeviceProcurementProcesses** to **Device Procurement Processes**. Your table names will now look like the image below.

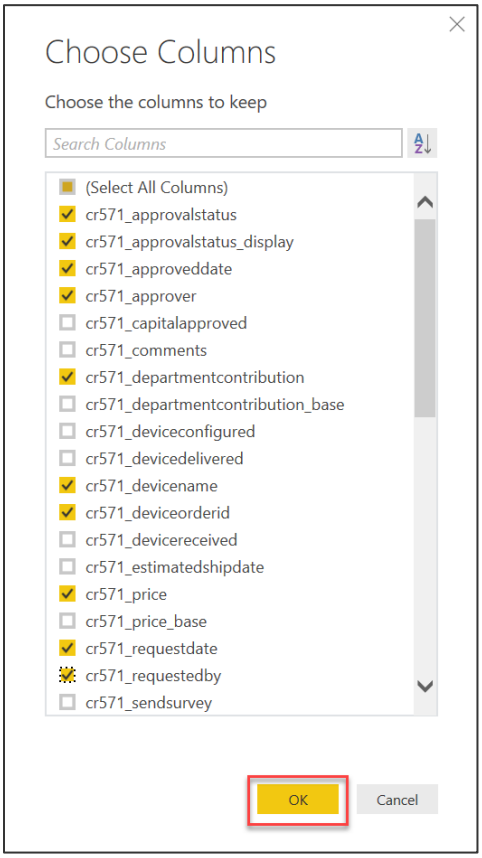


4. Next, we are going to remove columns from our query on the Device Order entity to make it fewer columns we need to work with.
5. Select the **Device Order** table and click **Choose Columns**. *Alternatively, you can also select the column header in the grid while holding the Ctrl key and then select the columns, then right-click and select Remove Other columns.*

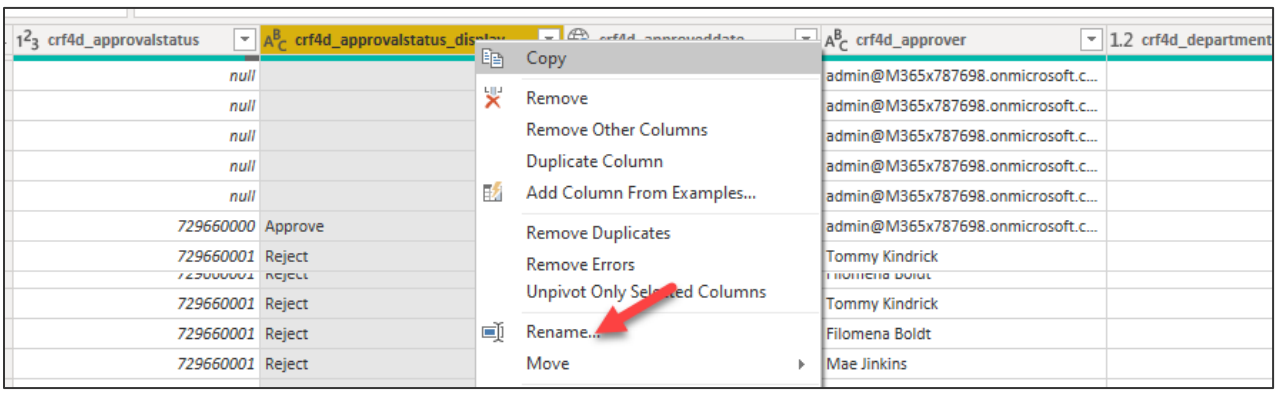


6. Un check the **Select All Columns** checkbox.

7. Select the columns listed below and click **OK**. Note: the action names will be in the format of <prefix>_<name>. The following are the names
    - Approvalstatus
    - Approvalstatus_display
    - Approveddate
    - Approver
    - Departmentcontribution
    - Devicename
    - Deviceorderid
    - Price
    - Requestdate
    - Requestedby



8. Right click on the **Approvalstatus_display** column header and click **Rename**.



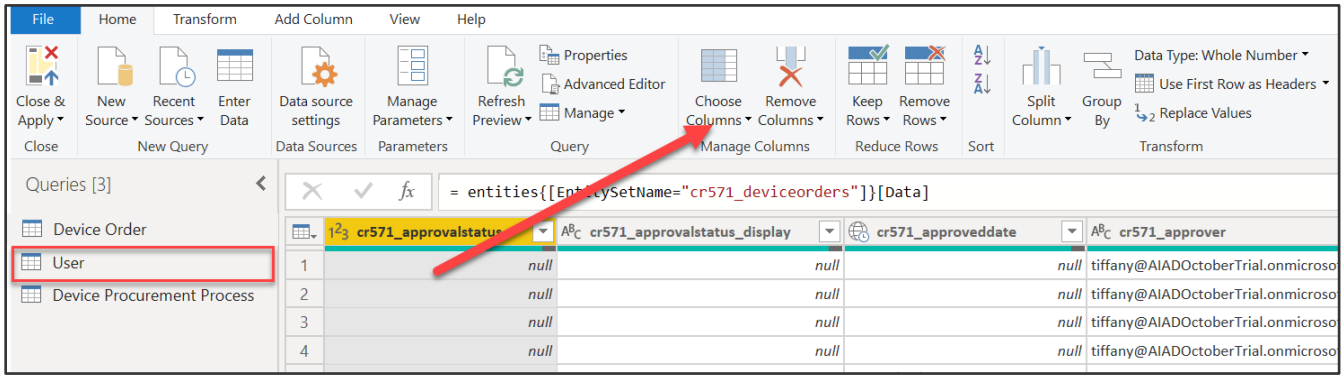
9. Rename the column **Approval Status.**

	cr571_approvalstatus	Approval Status	cr571_approveddate	cr571_approver
1	null	null	null	tiffany@AIADOctoberTrial.onmicrosoft.com
2	null	null	null	tiffany@AIADOctoberTrial.onmicrosoft.com
3	null	null	null	tiffany@AIADOctoberTrial.onmicrosoft.com
4	null	null	null	tiffany@AIADOctoberTrial.onmicrosoft.com
5	322730000	Approve	10/25/2019 3:00:29 AM +00:00	tiffany@AIADOctoberTrial.onmicrosoft.com
6	322730001	Reject	10/25/2019 3:00:33 AM +00:00	tiffany@AIADOctoberTrial.onmicrosoft.com
7	322730000	Approve	10/25/2019 3:31:12 AM +00:00	tiffany@AIADOctoberTrial.onmicrosoft.com
8	322730000	Approve	10/25/2019 3:36:15 AM +00:00	tiffany@AIADOctoberTrial.onmicrosoft.com

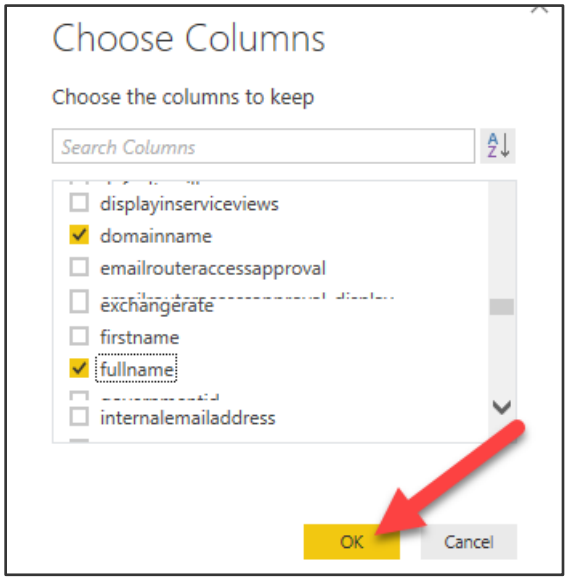
10. Rename the rest of the columns as shown below. You may rename other fields if you have time but not required for the lab.

Current Name	New Name
approvalstatus	Approval Status ID
approveddate	Approved Date
approver	Approver
departmentcontribution	Department Contribution
devicename	Device Name
deviceorderid	Device Order
price	Price
requestdate	Request Date
requestedby	Requested By

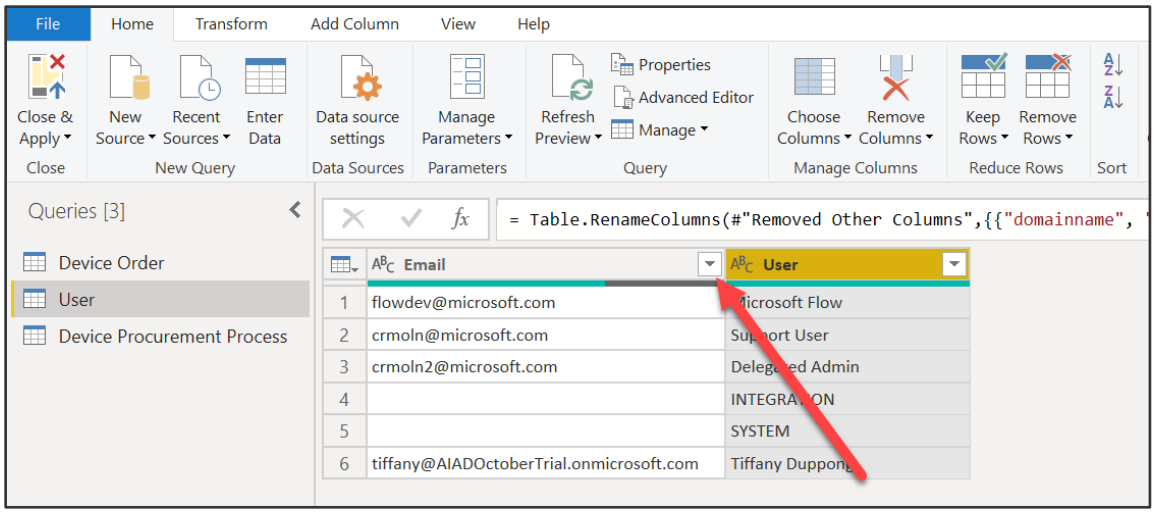
11. Select the **User** table and click Choose Columns.



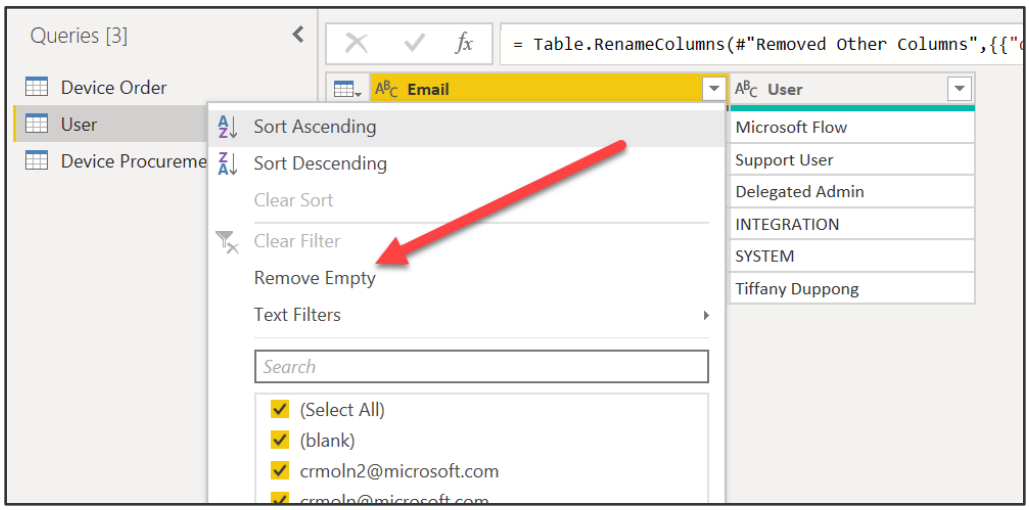
12. Uncheck Select All Columns
13. Select **domainname**, **fullname** and click **OK**. Tip: Using Search can speed up finding the columns.



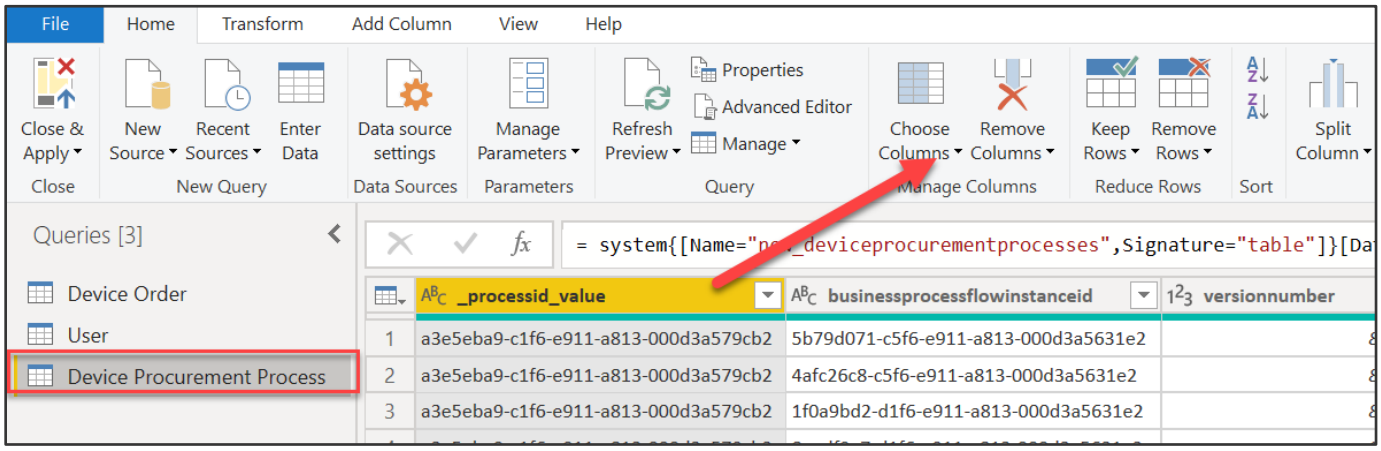
14. Rename the **domainname** column to **Email** and the **fullname** column to **User**.
15. Click Sort on the **Email** column.



16. Click **Remove Empty**.



17. Select the **Device Procurement Process** table and click **Choose Columns**.

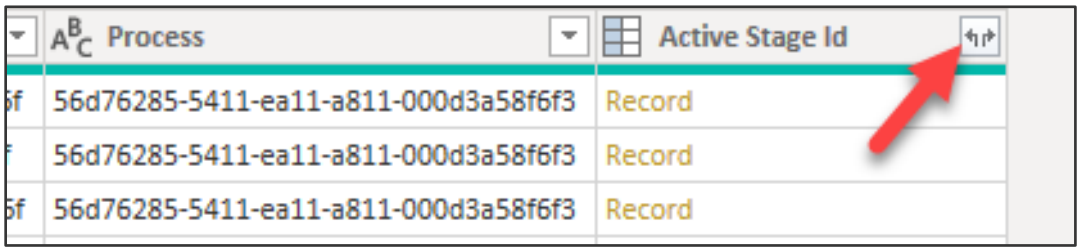


18. Uncheck **Select All Columns.**
19. Select the columns listed below and click OK.
    - bpf_name
    - _processid_value
    - completedon
    - businessprocessflowinstanceid
    - _bpf__CRC69_deviceorderid_value (Note: the CRC69 might be different in your list)
    - Activestageid

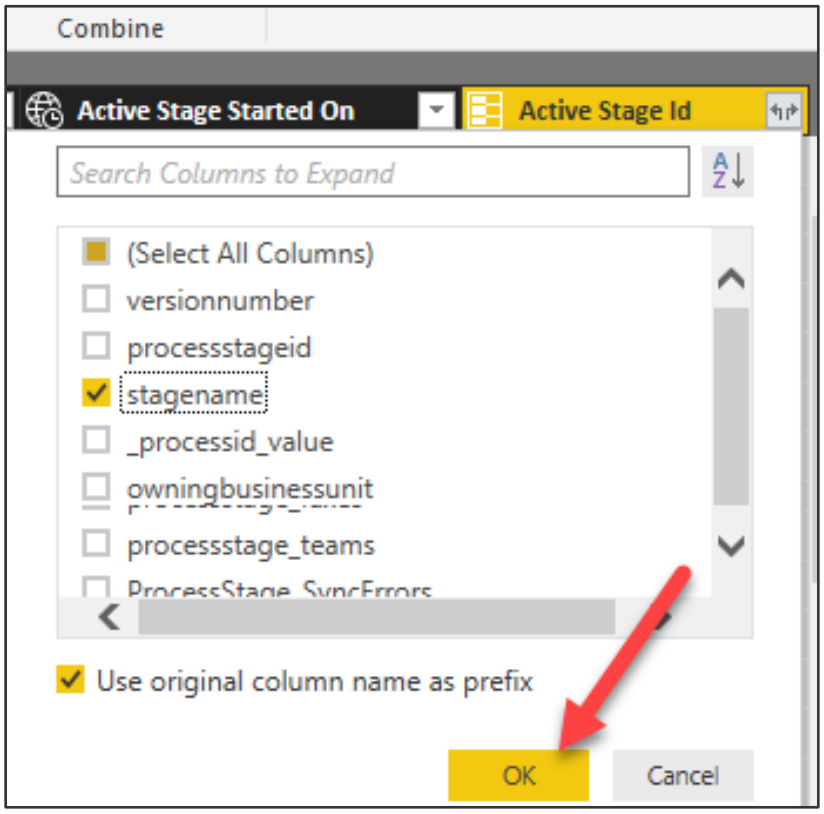
20. Rename the fields as shown below. You may rename the other fields.

Current Name	New Name
bpf_name	Name
_processid_value	Process
businessprocessflowinstanceid	Device Procurement Process
_bpf__CRC69_deviceorderid_value (Note: the CRC69 might be different in your list)	Device Order
activestageid	Active Stage Id
completedon	Completed On

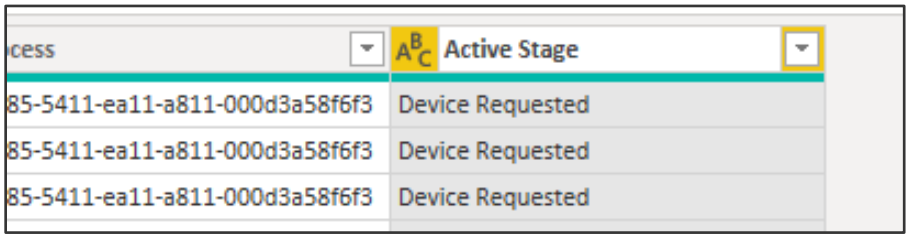
21. Expand the **Active Stage** column. This will allow us to select one or more values from the related entity.



22. Select **stagename** and click OK.

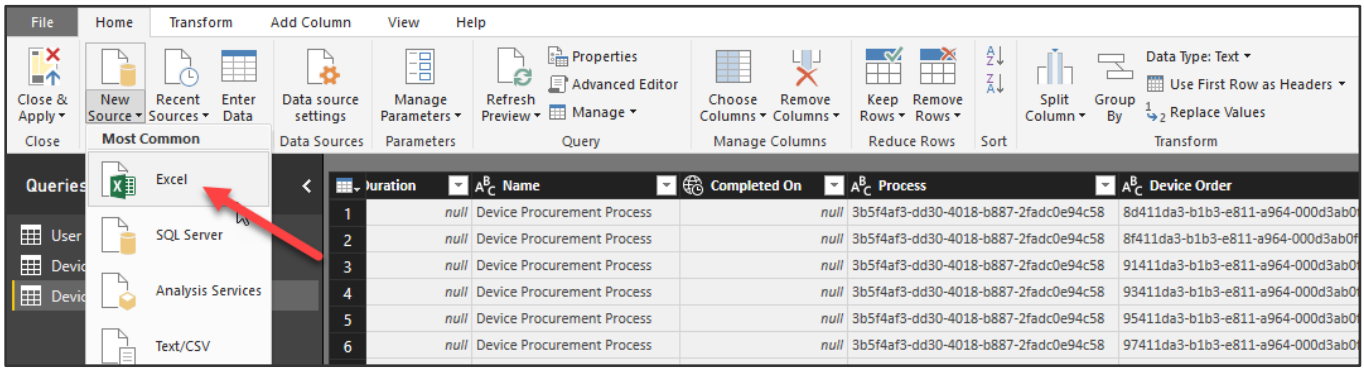


23. Rename the column to **Active Stage**.

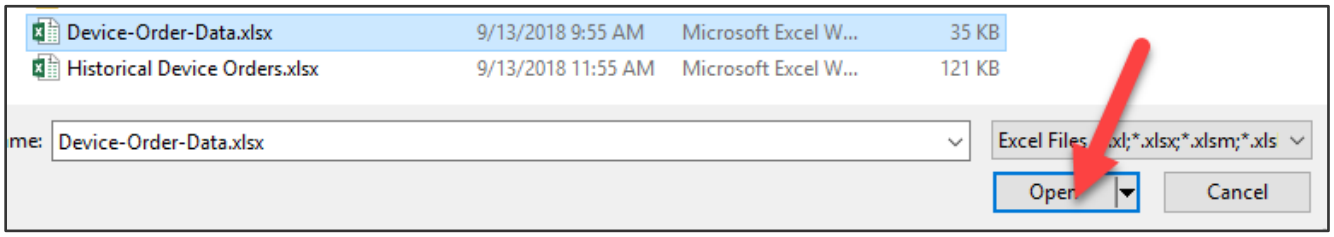


Task 3: Add Device Manufacturer Data

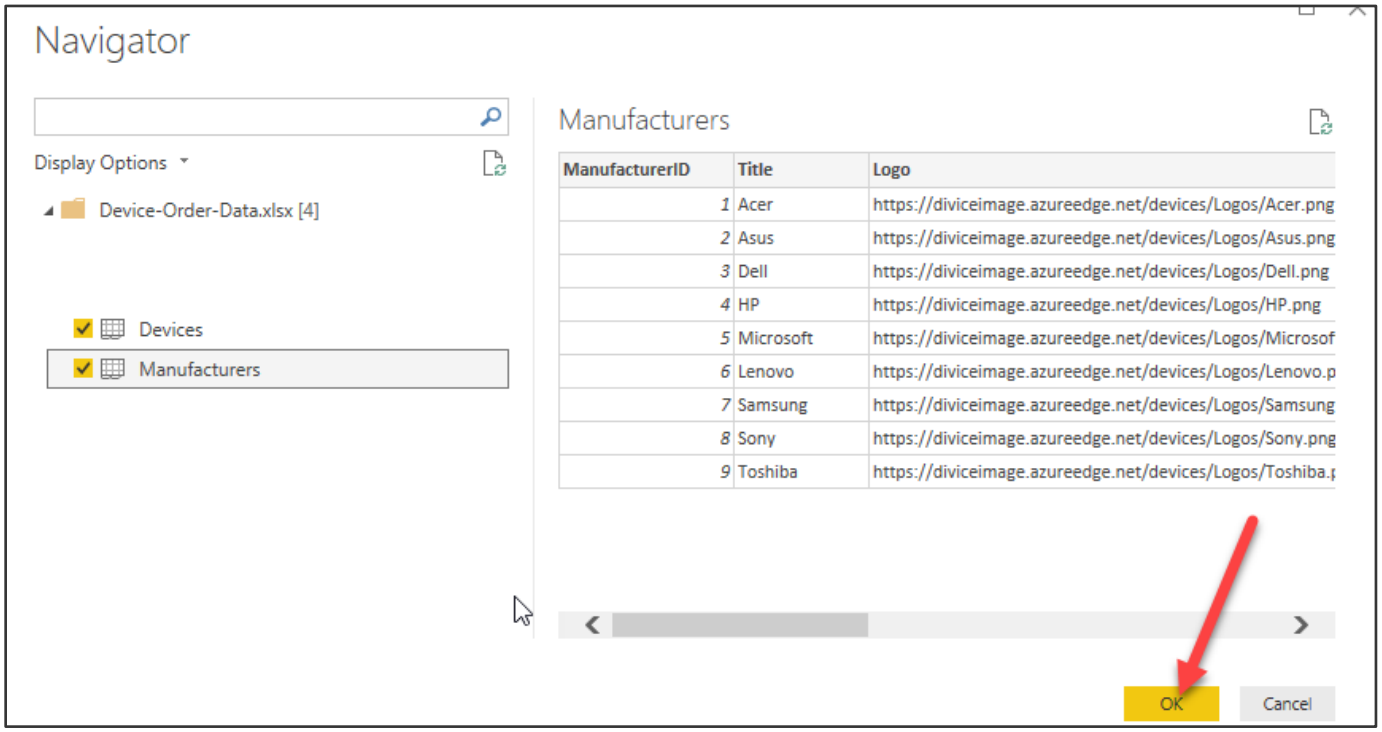
1. Select the Home tab, click **New Source**, and select **Excel**.



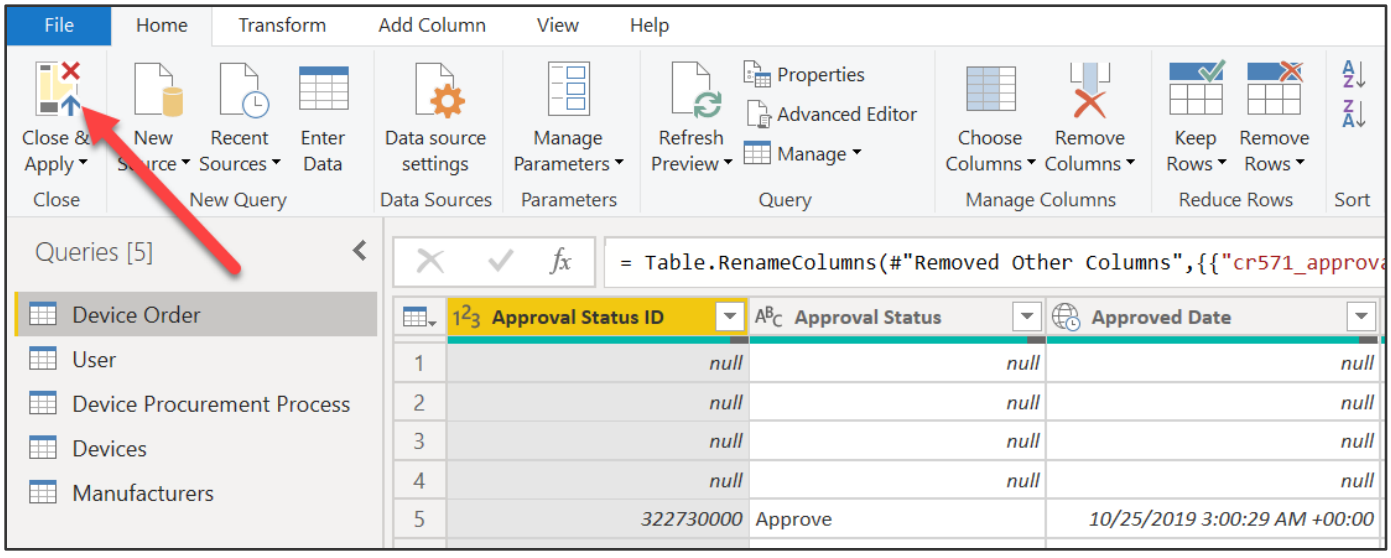
2. Select the Device Manufacturer Data (**Device Order Data.xlsx**) file provided to you and click Open.



3. Select the **Devices** and **Manufacturers** tables and click OK.

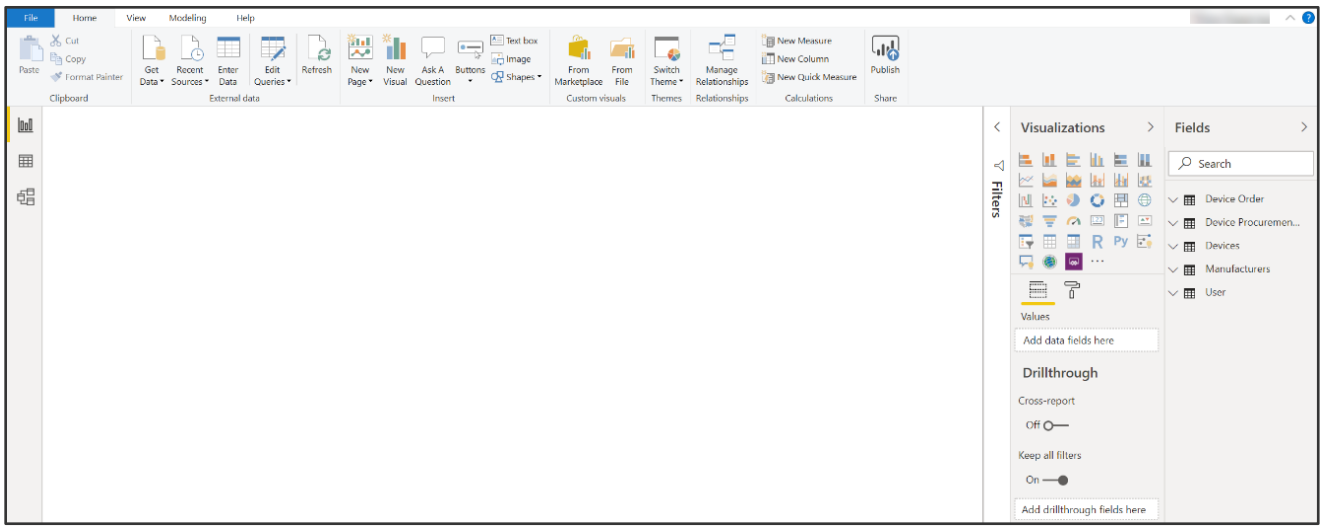


4. Click **Close and Apply**.



Note: Power Query has a lot of powerful transformations that can be done including trimming, replacing values, transpose, change data type, and many more. Each of these transformations are built as an M query that is applied each time you refresh the data. You can see the query that is built by clicking on the Advanced Editor button.

5. The Power Query editor will close, and you will be back on the Power BI Desktop.

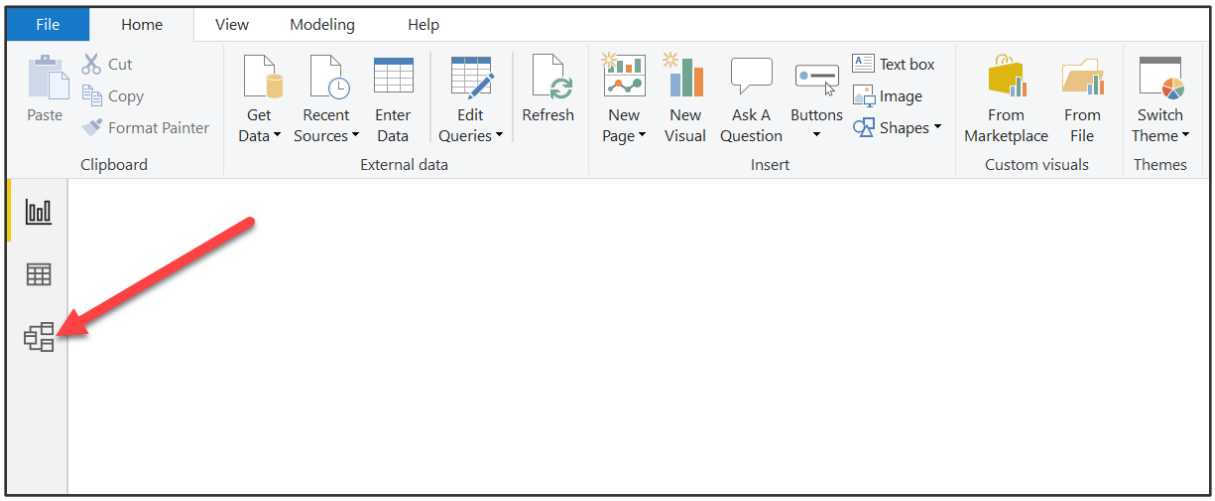


Exercise 4: Setup Relationships and Calculated Columns

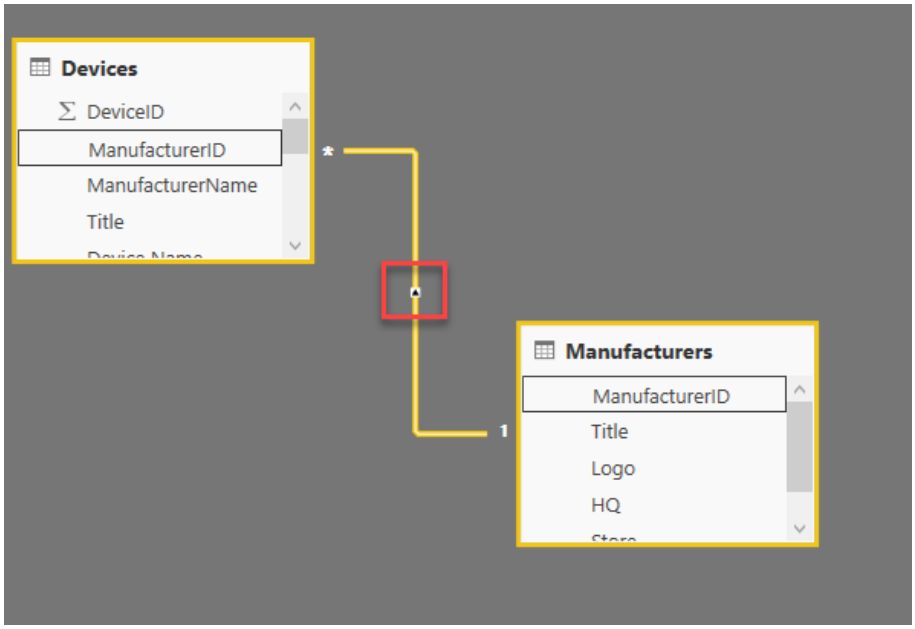
Task 1: Manage Relationships

In this task, you will establish the relationships between the data. You will notice auto detection identifies a couple of relationships within the data. In this task you will be establishing the remaining relationships.

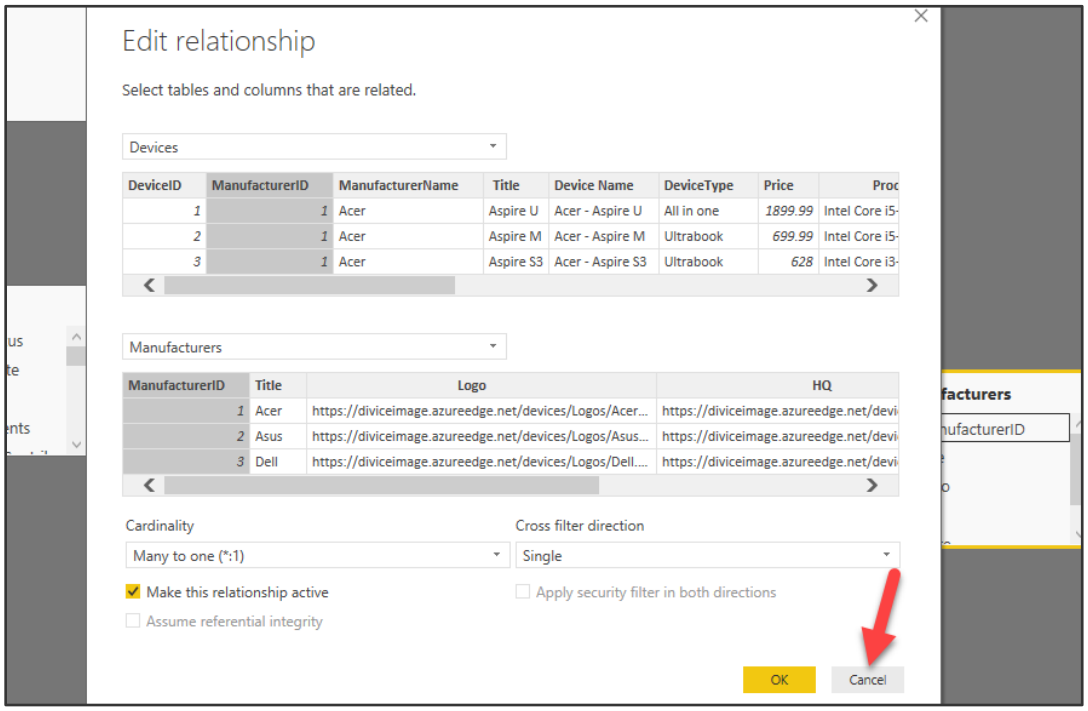
1. Select **Relationships** from the left side navigation.



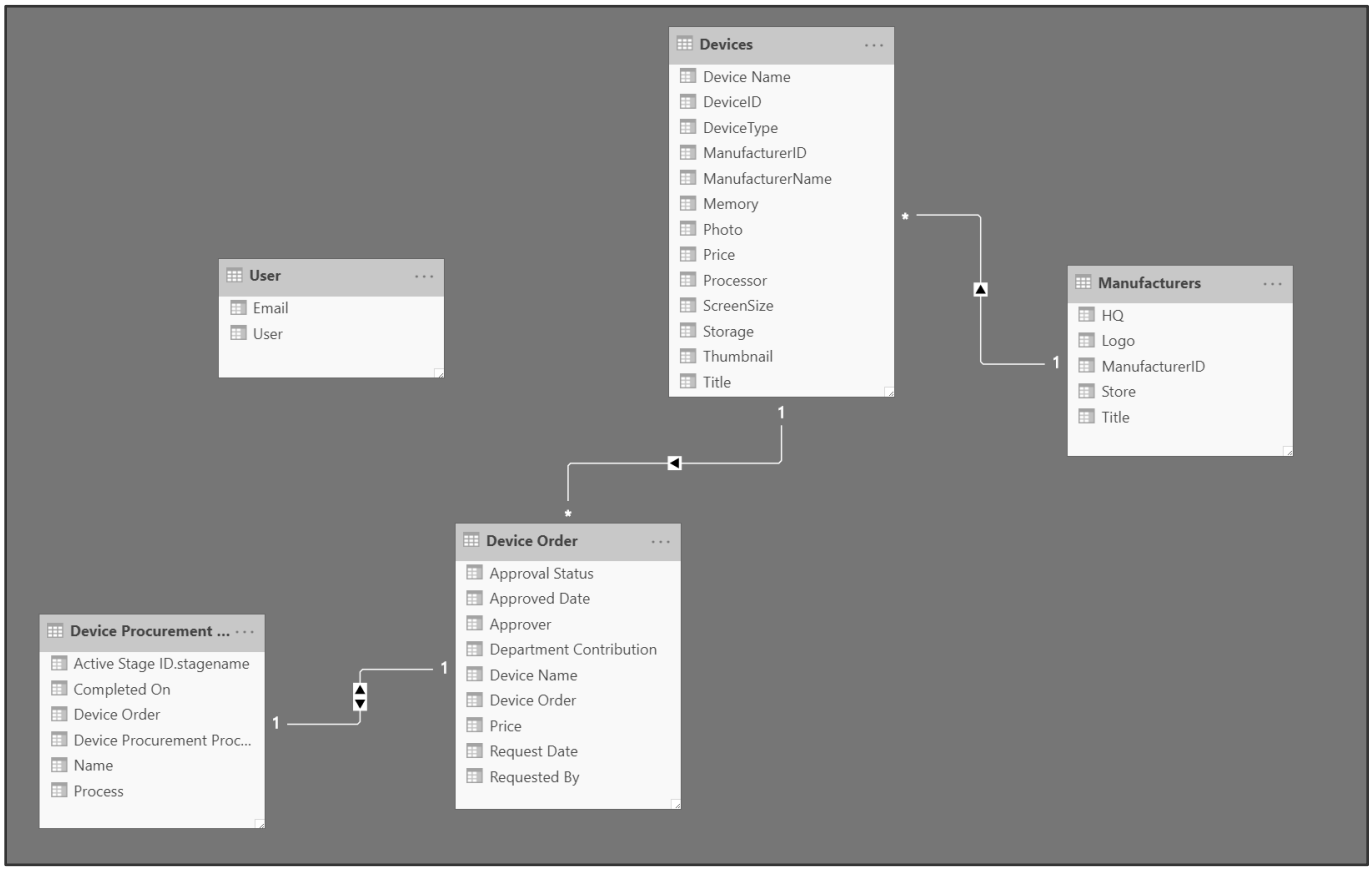
2. Double click the **Devices** to **Manufacturers** autodetected relationship, this action will load the Edit relationship page. Here you can see the settings on the relationship and make any changes that was required to existing relationships.



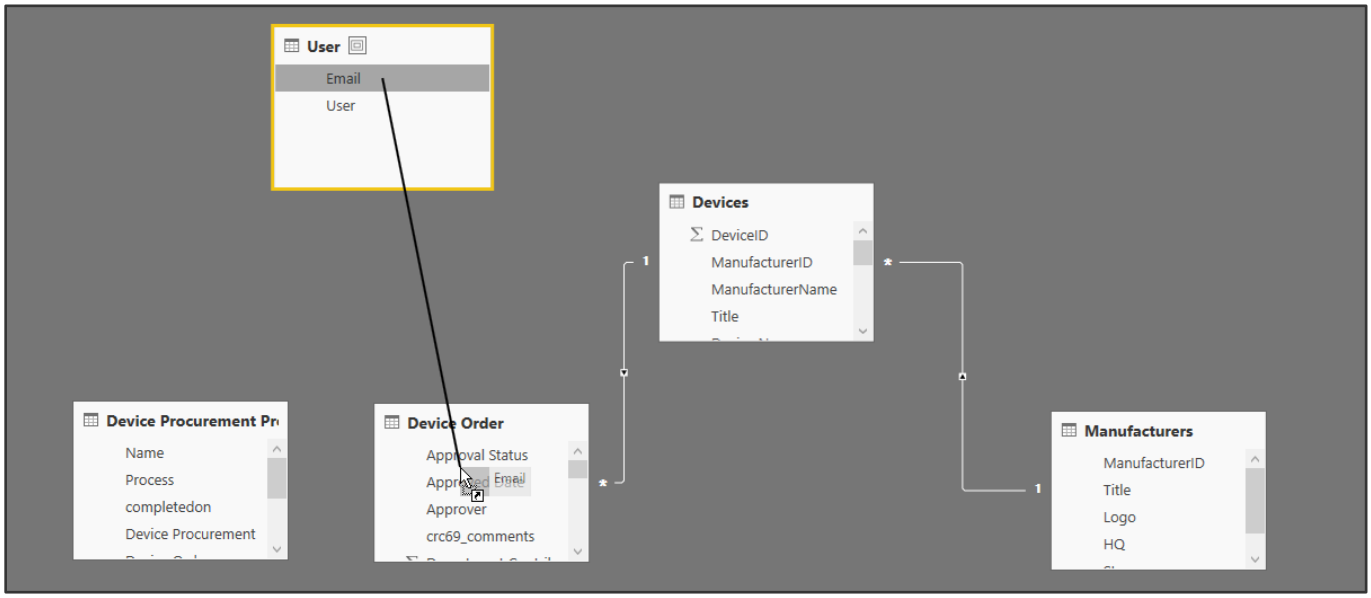
3. Click **Cancel** to close the page.



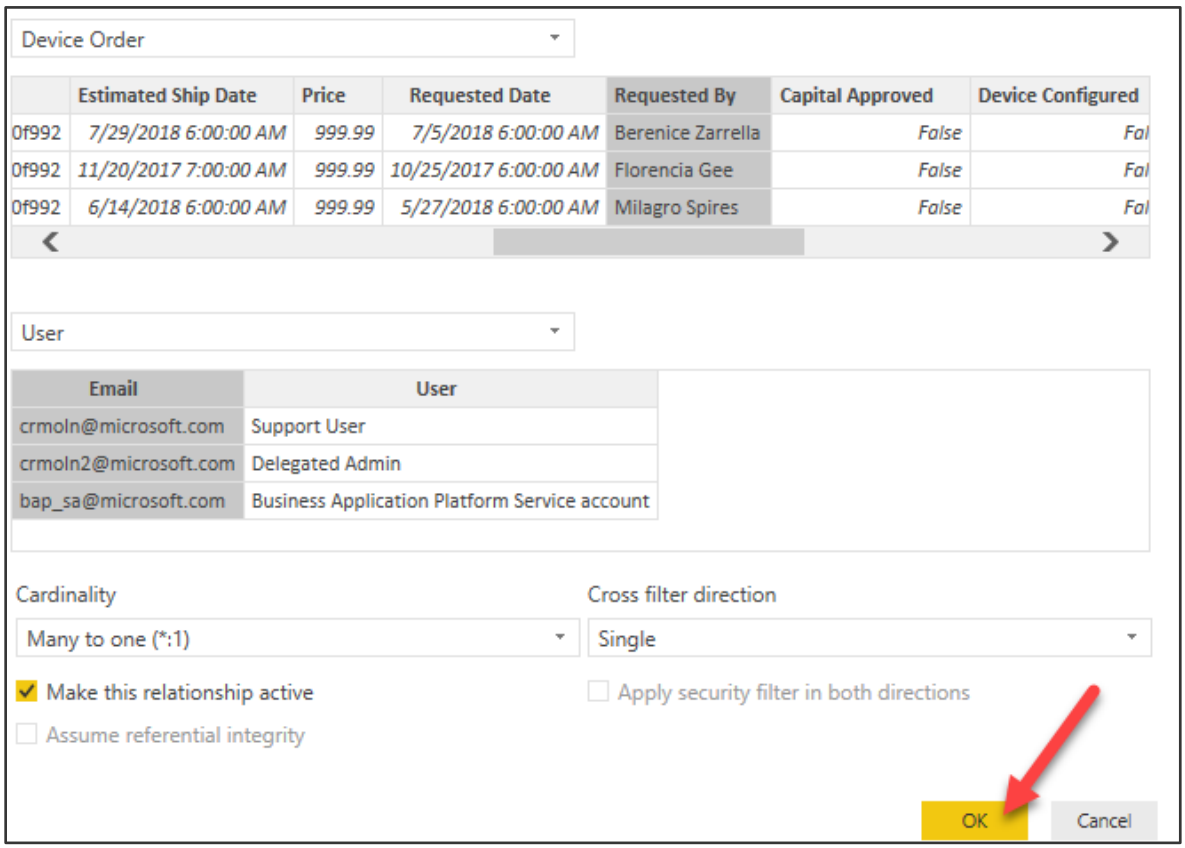
4. Reposition the table as shown in the image below, so it will be easier to visualize the relationships. If you don't immediately see the User table, scroll left.



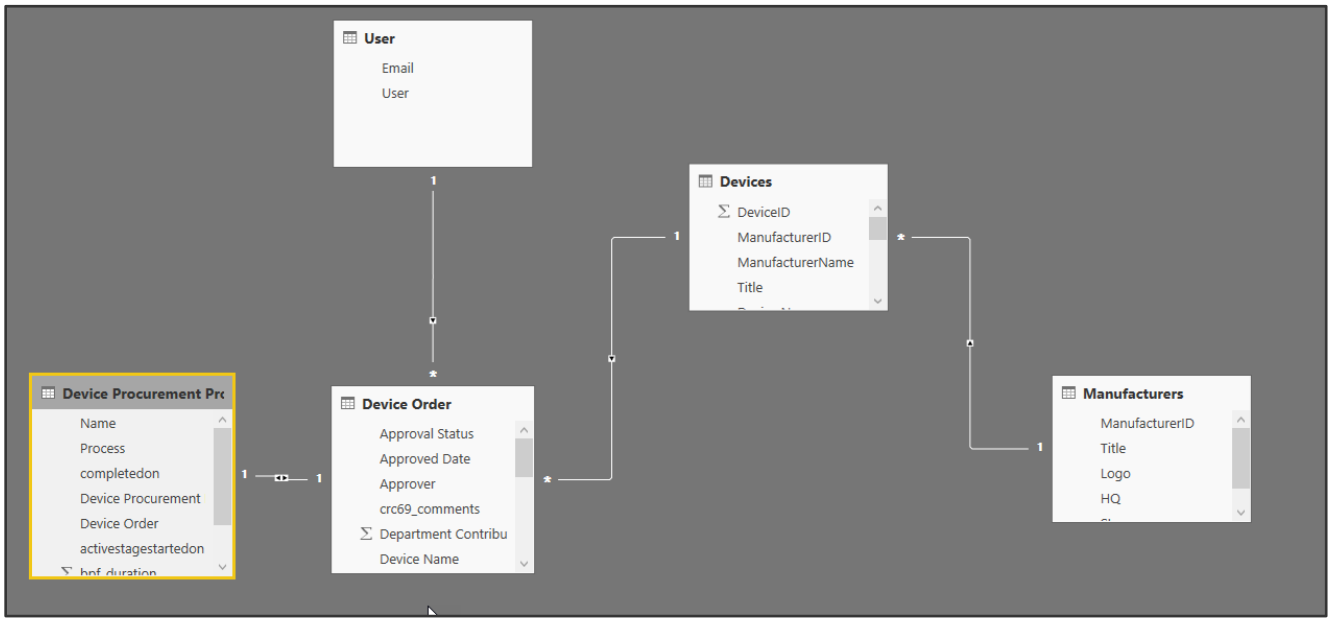
5. Drag the Email column of the **User** table to the **Device Order** table and release it.



6. A One to Many relationship will be created. Double click on the new relationship to edit the properties
7. Select **Requested By** from the **Device Order** table and **Email** from **User** table. Click **OK**. *Note: Yes the Requested By should also have e-mails in order for them to match, this is just different in the historical data you imported and won't impact your results in this lab.*



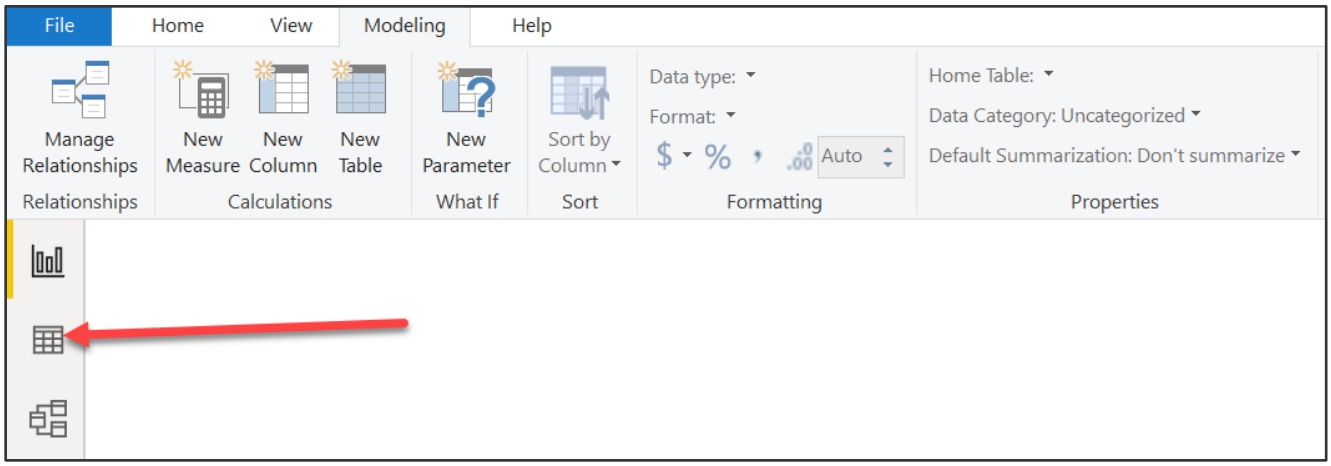
8. Your relationships will now look like the image below.



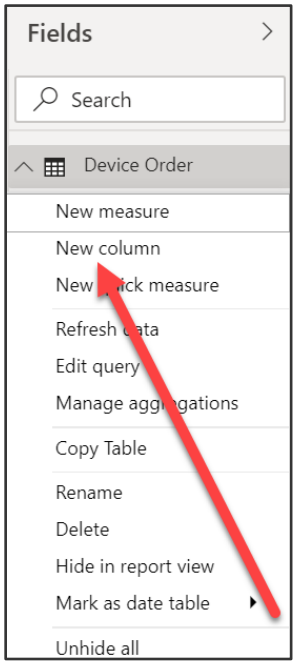
Task 2: Add Link to the Common Data Service (CDS) Record Form

A common ask when building a Power BI visual of CDS data is to allow the user to open the record using the CDS form. In this task you will build a column that will be a link to directly open the record.

1. Select **Data**.



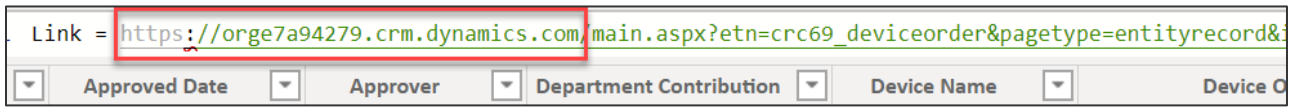
2. Right click on the **Device Order** table and select **New Column**.



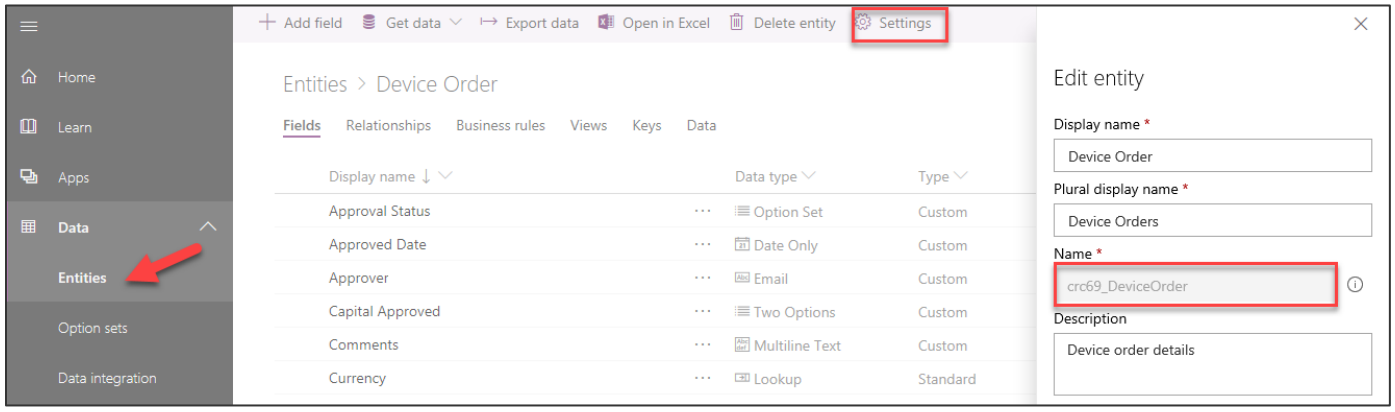
3. Provide the function below to build the column value. This needs to be adjusted to match your organization url and entity type name that can vary from environment to environment, for now paste it in exactly like you have below

Link = "https://orgb0a32835.crm.dynamics.com/main.aspx?etn=crc69_deviceorder&pagetype=entityrecord&id=%7B"&'Device Order'[Device Order]&"%7D"

4. Now get your organization URL, you can get this from Admin Power Platform by selecting the environments and then … and then open copy the url and replace it in the function

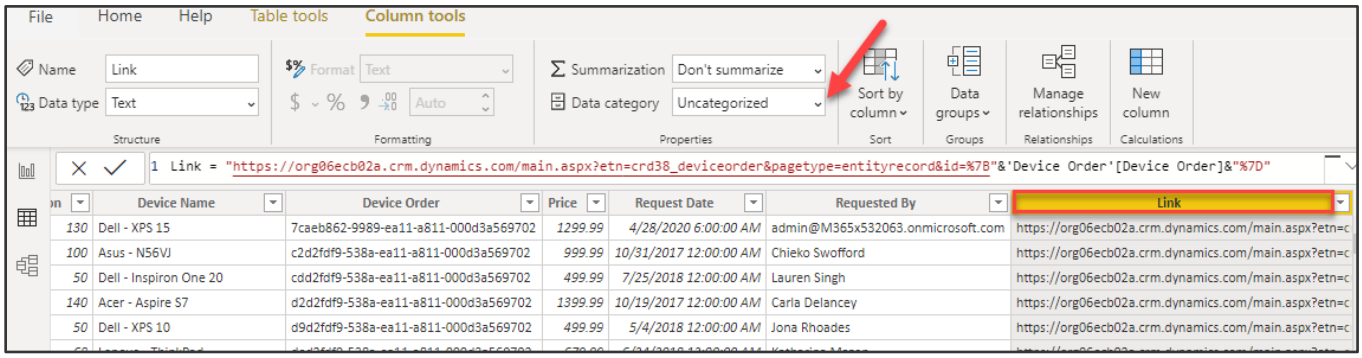


5. Next, we need to get the entity schema name for Device Order. You can get that by going to make.powerapps.com>Data>Entities>Device Order>Settings, and copy the prefix of the entity.

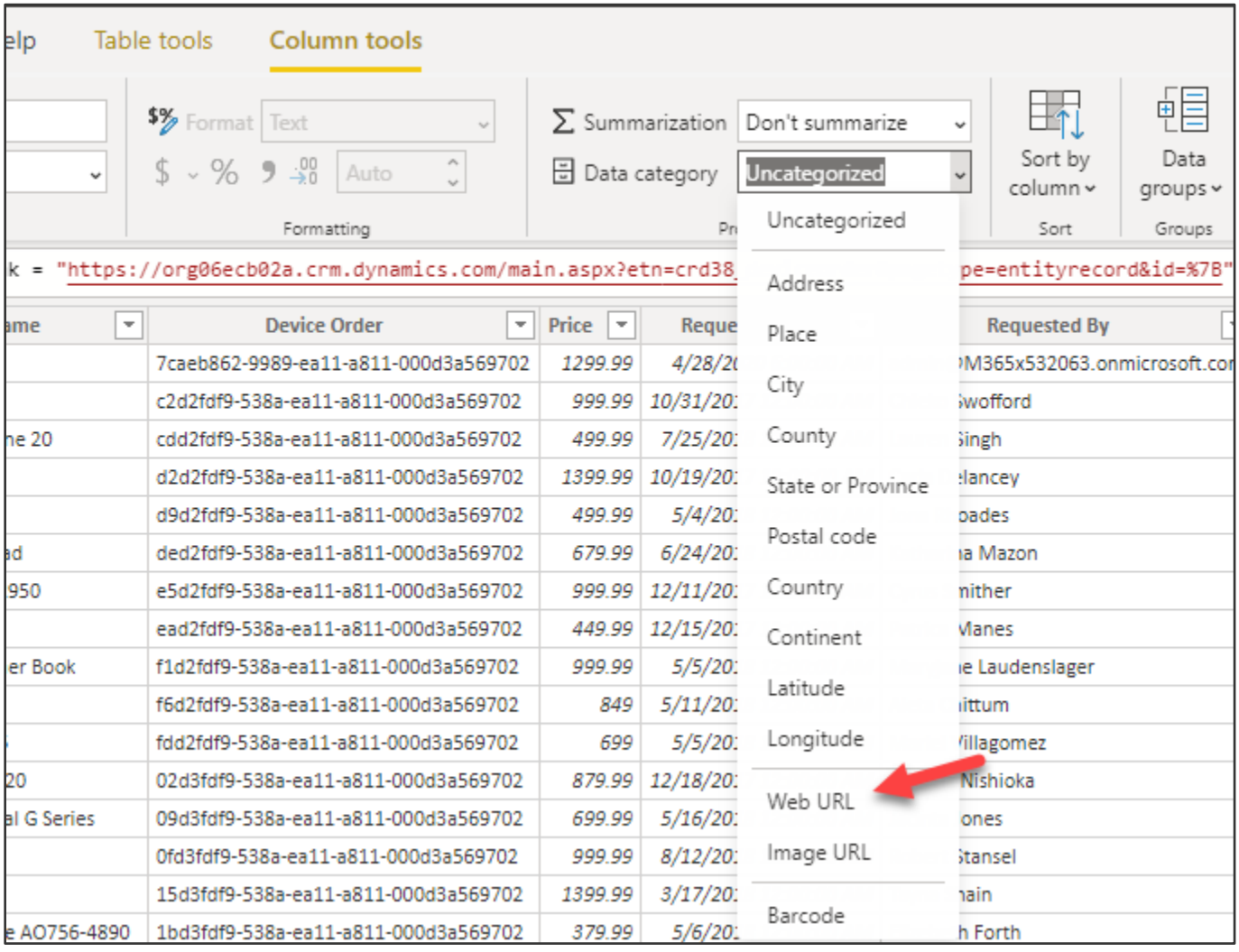


6. If your value is different than what is in the Link function, replace it in Power BI. This value can vary from environment to environment

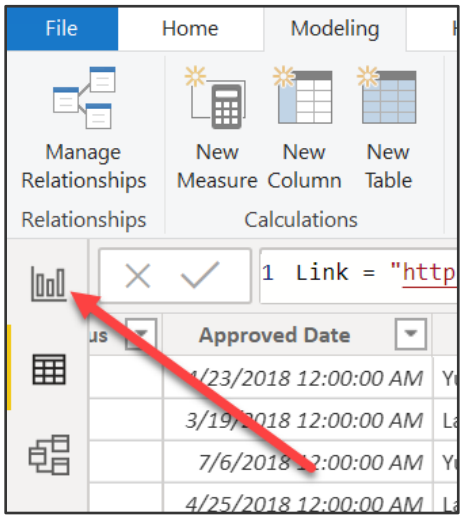
7. Select the new column and from the **Column tools** tab click on the **Data Category** dropdown.



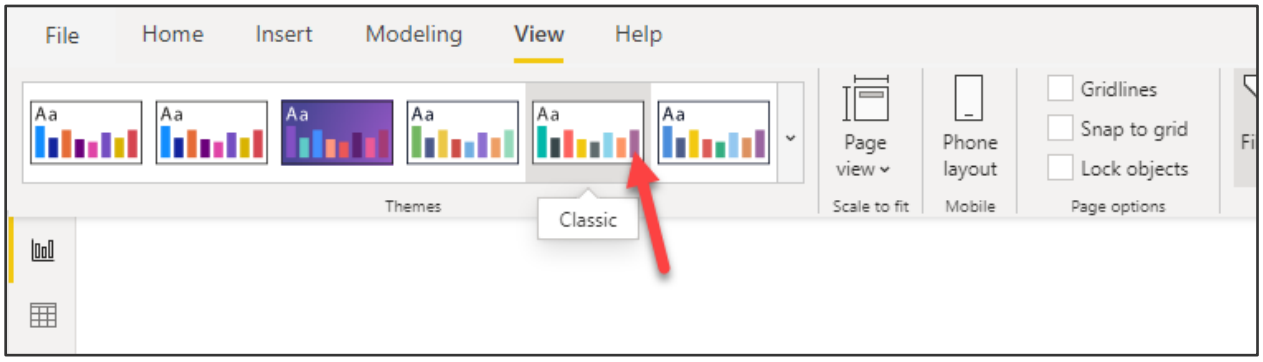
8. Select **Web URL.**



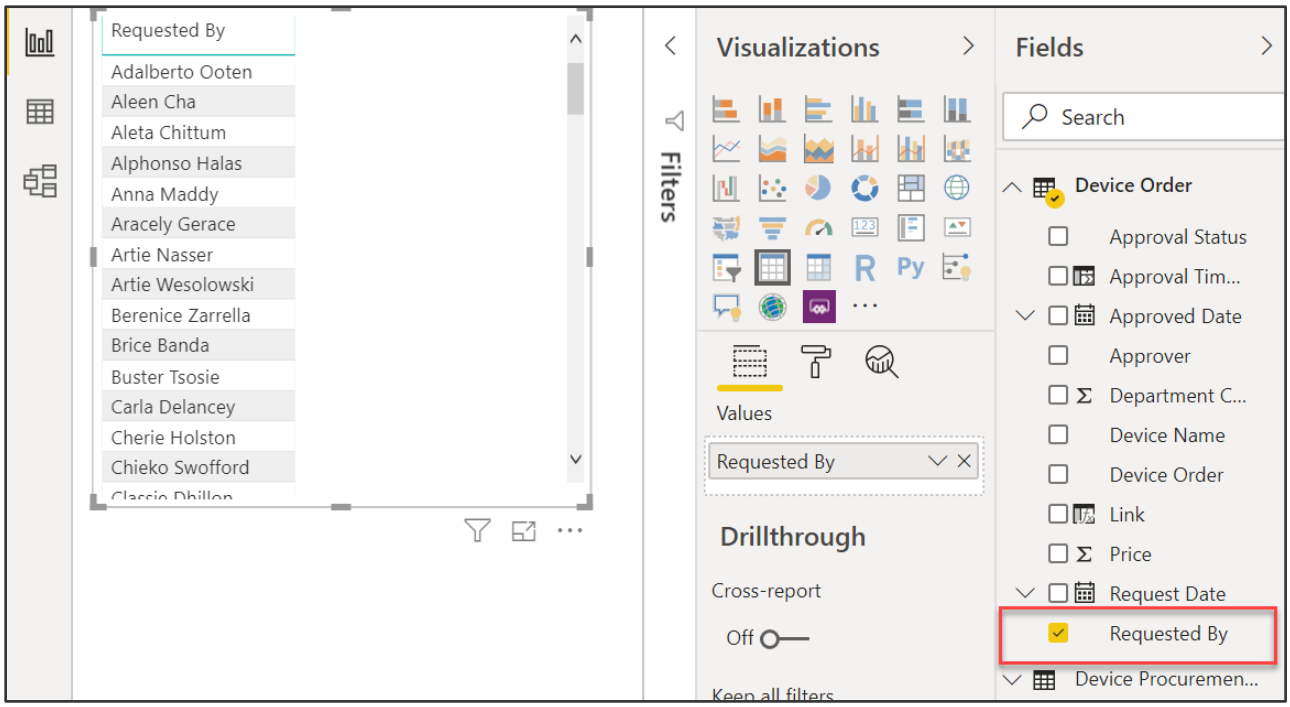
9. Select **Reports**.



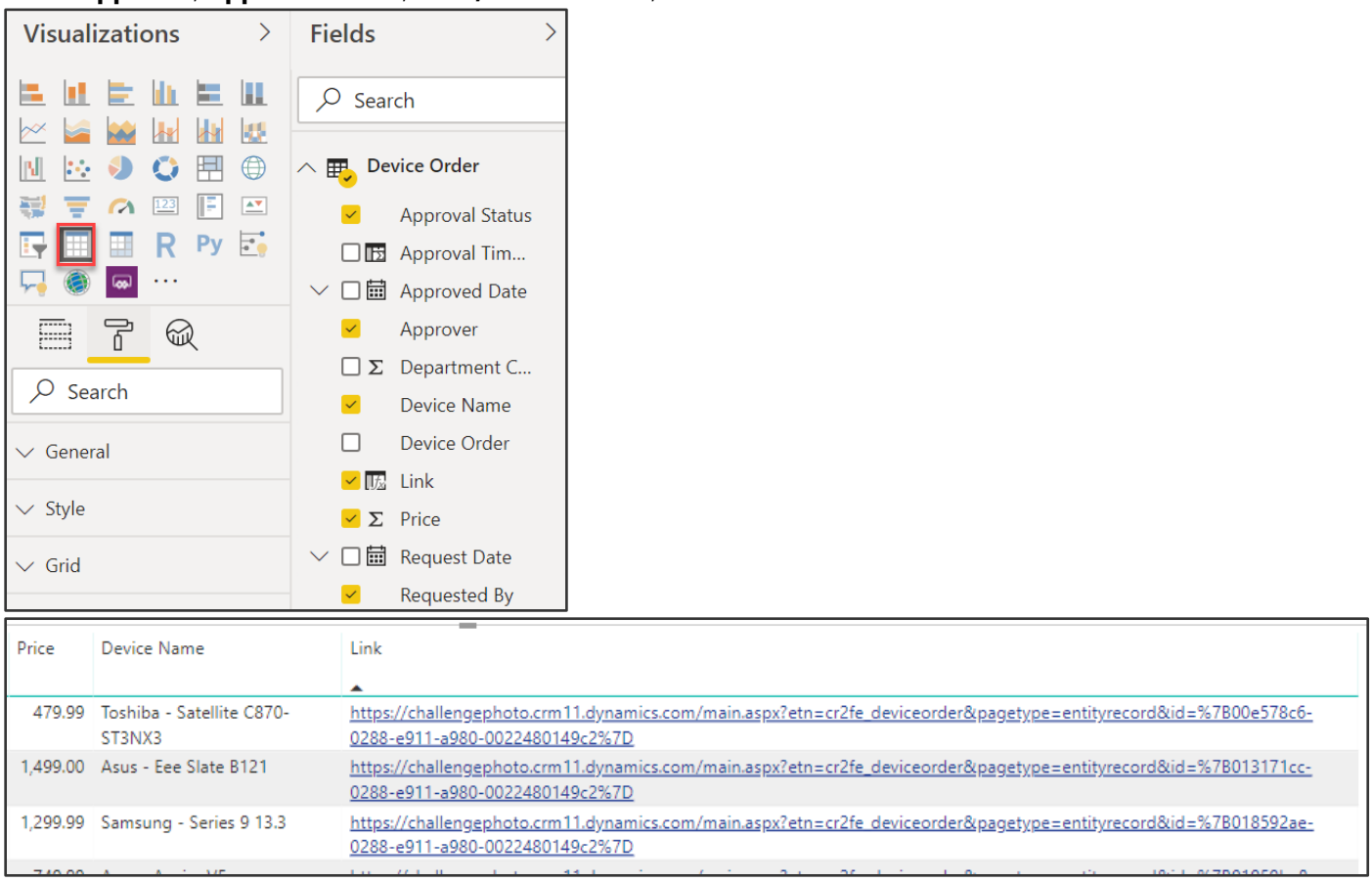
10. From the View tab and switch the theme to **Classic**.



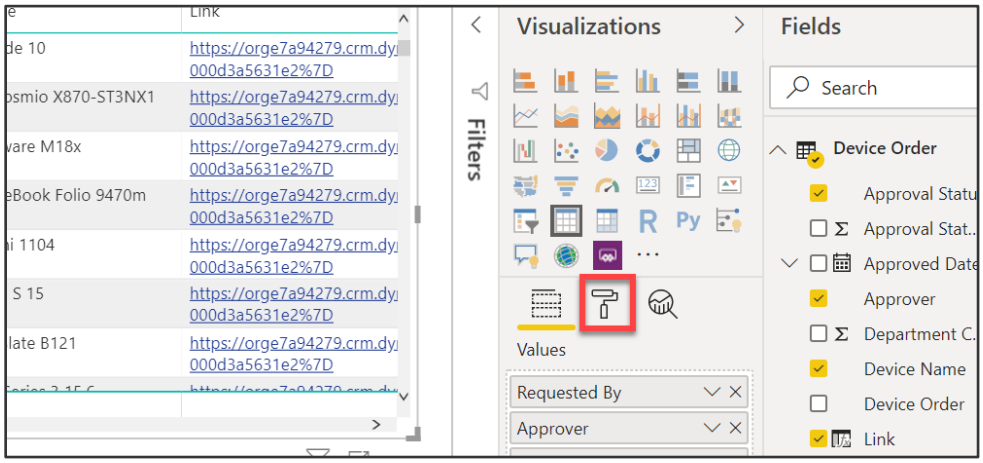
11. Expand the **Device Order** table and select **Requested By**.



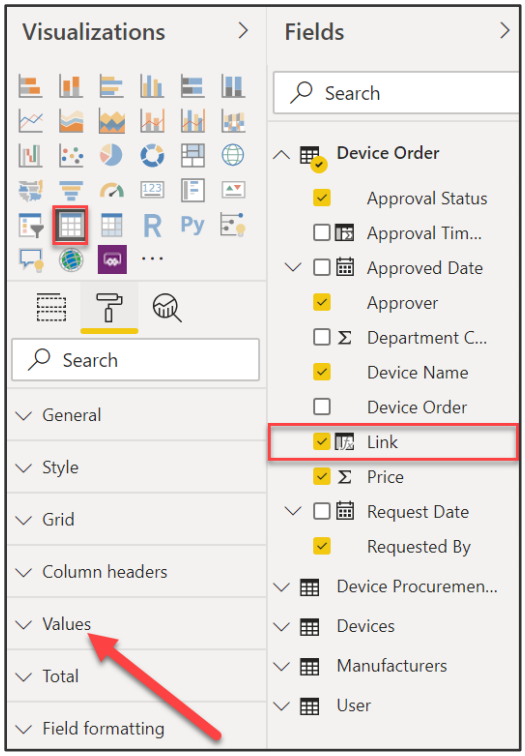
12. Select **Approver**, **Approval Status**, **Price, Device Name**, and **Link** from the Device Order table.



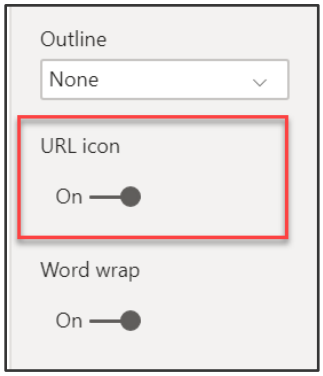
13. Select the **Format** tab



14. Select the **Link** column and from the **Format** tab, expand **Values**.



15. Turn on the **URL Icon**.



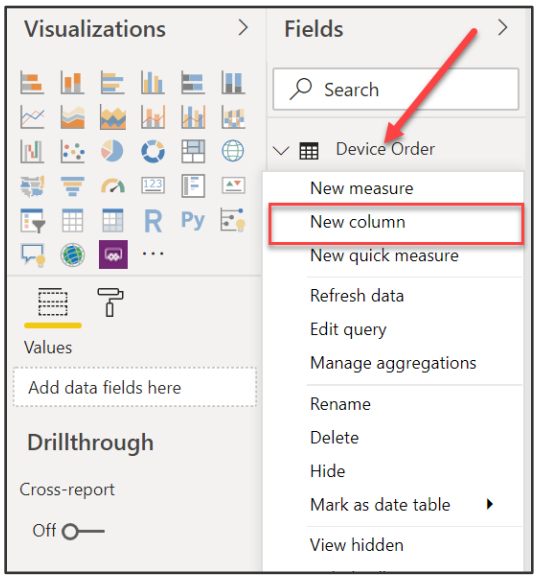
16. Click on the link. Your CDS record should open.

equested By	Approver	Approval Status	Price	Device Name	Link
nna Maddy	Patience Patman	Approve	1,299.99	Asus - ET2701INTI	
rtie Nasser	Emanuel Chapdelaine	Approve	799.99	Sony - VAIO S	
hieko Swofford	Latrice Critelli	Approve	879.00	Lenovo - B540	
orsche Espinal	Filomena Boldt	Approve	699.99	Lenovo - Essential G Series	
ollie Garn	Gita Vannote	Approve	699.99	Lenovo - G480	
oncetta Nagao	Emanuel Chapdelaine	Approve	419.99	Samsung - Series 3 15.6	
atharina Mazon	Joanna Hoos	Approve	379.99	Acer - Aspire E	
lphonso Halas	Latrice Critelli	Reject	419.99	Samsung - Series 3 15	
erline Younce	Yuri Mignone	Reject	1,399.99	Asus - ET2411INT	
amey Revard	Emanuel Chapdelaine	Reject	1,099.99	Asus - Zenbook	
usan Coover	Patience Patman	Approve	1,349.00	HP - HP EliteBook Folio 9470m	

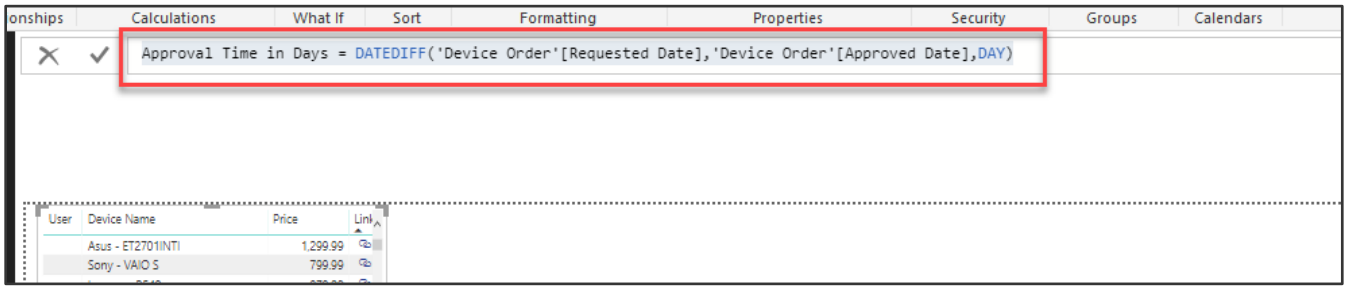
Task 3: Add a Calculated Field for approval time

In this task, you will add a calculated column with the approval time inn days, you will add a column chart to the report page.

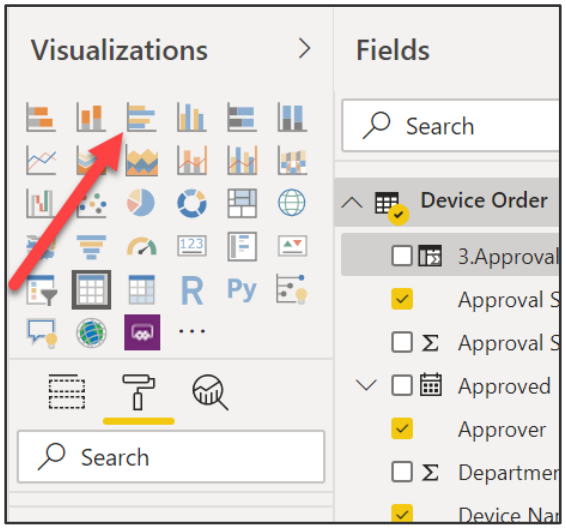
1. Right click on the **Device Order** table and select **New Column**.



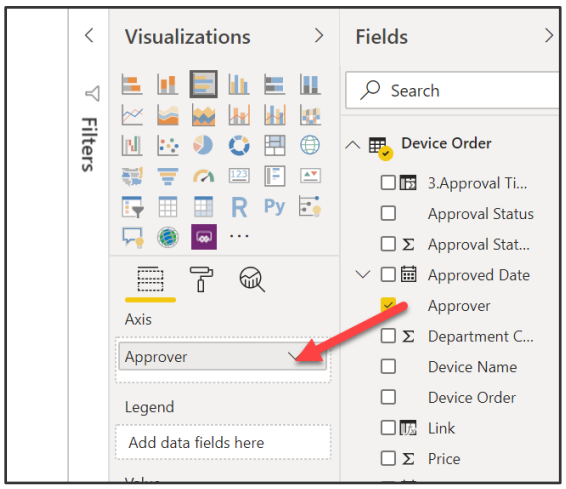
2. Type in the formula bar.
   ```
   Approval Time in Days = DATEDIFF('Device Order'[Request Date],'Device Order'[Approved Date],DAY)
   ```



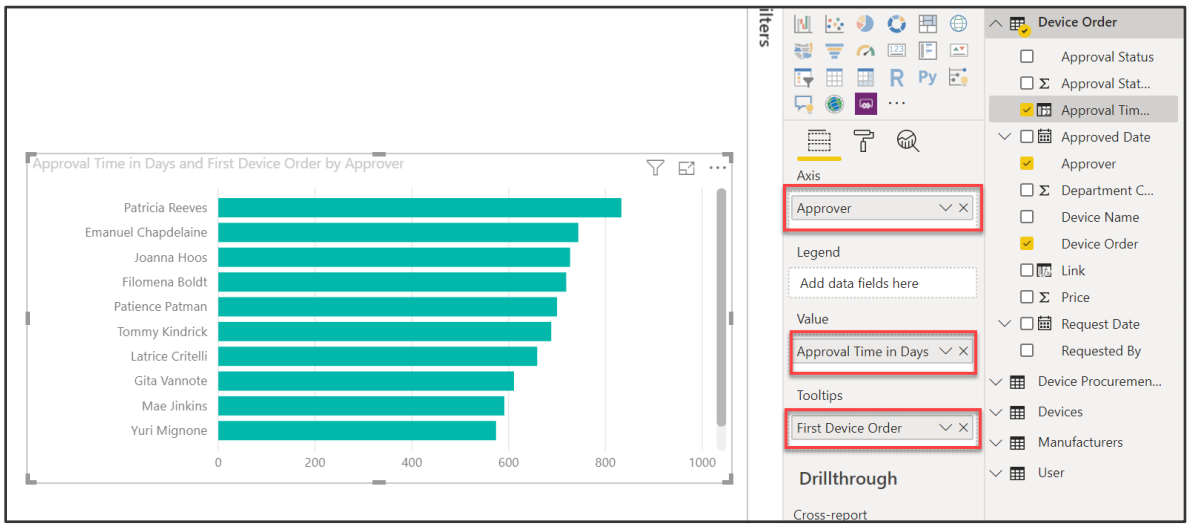
3. Select the canvas to make sure the list of device orders is no longer selected
4. Click **Clustered Bar Chart**.



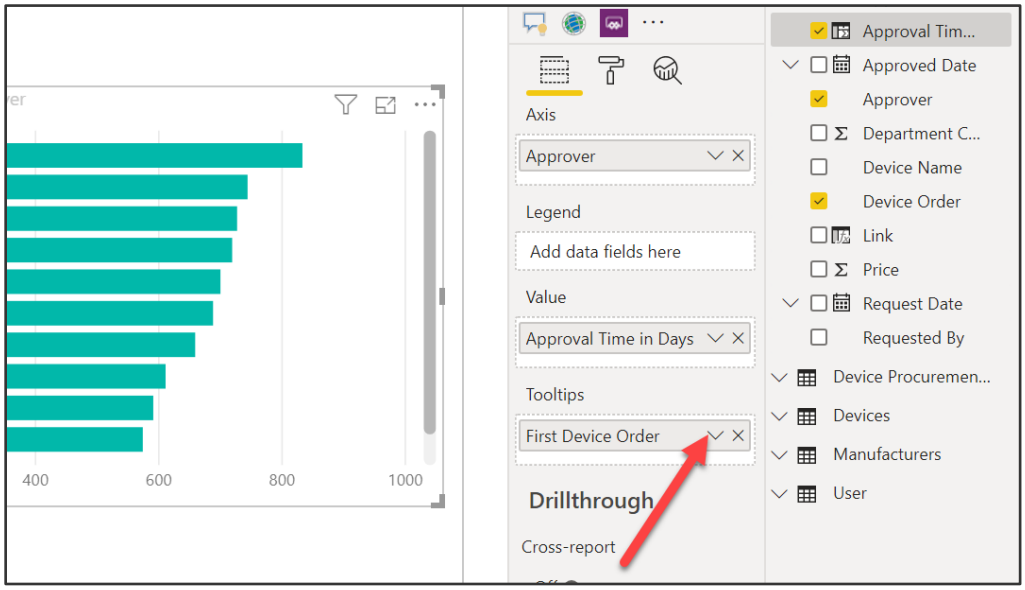
5. Select the chart you added, drag the **Approver** column and drop it in the **Axes** target.



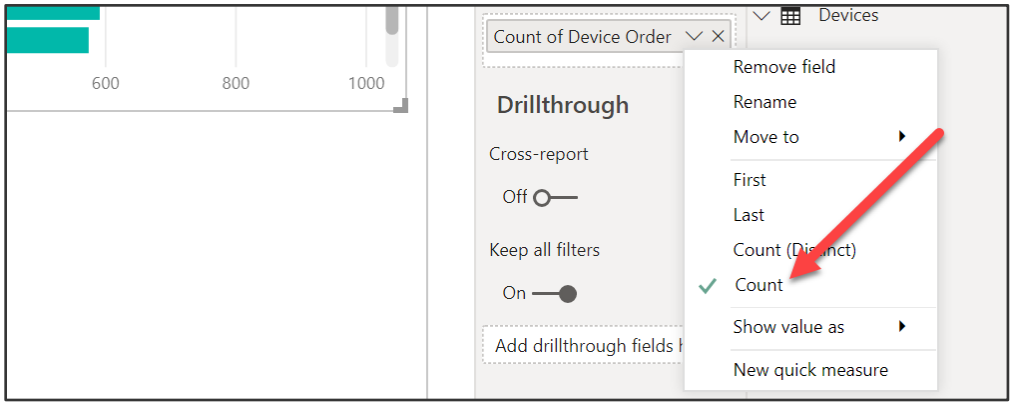
6. Drag **Approval Time in Days** to the Value target and drag **Device Order** to the Tooltip target.



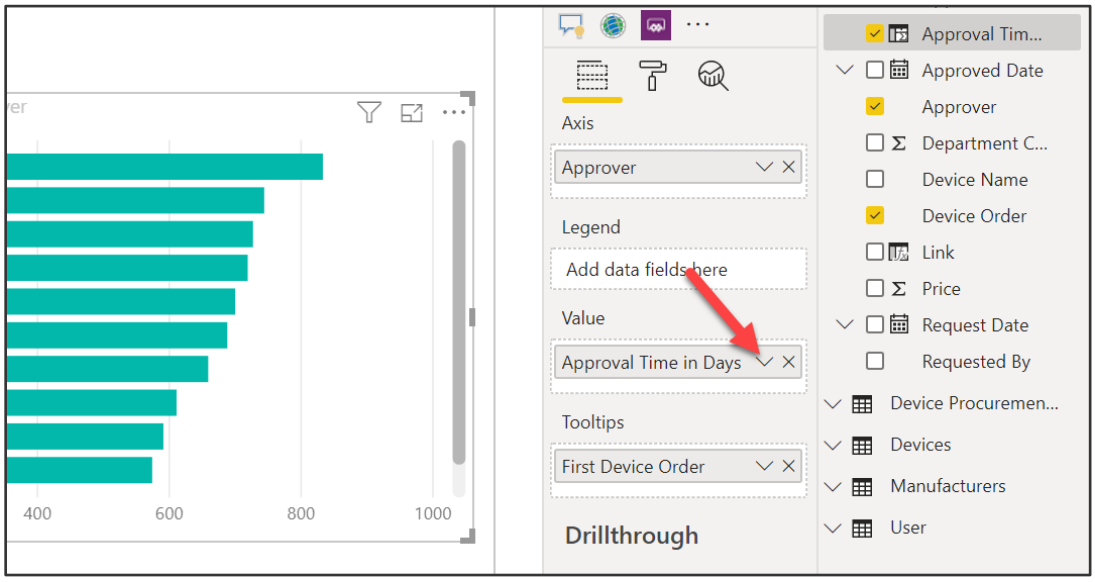
7. Click on the dropdown button next to the **First Device Order**.



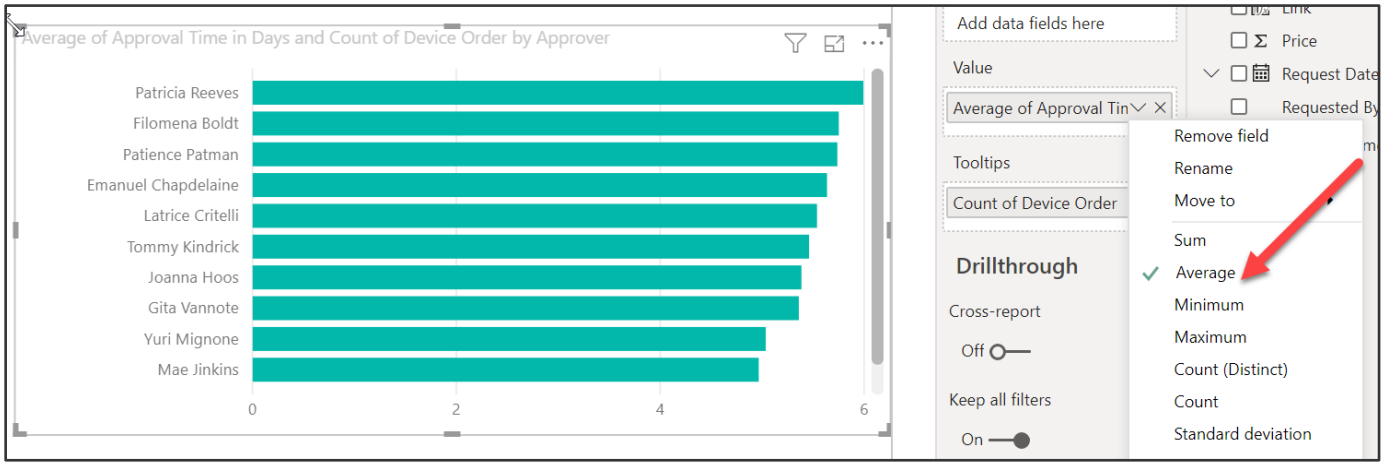
8. Select **Count**.



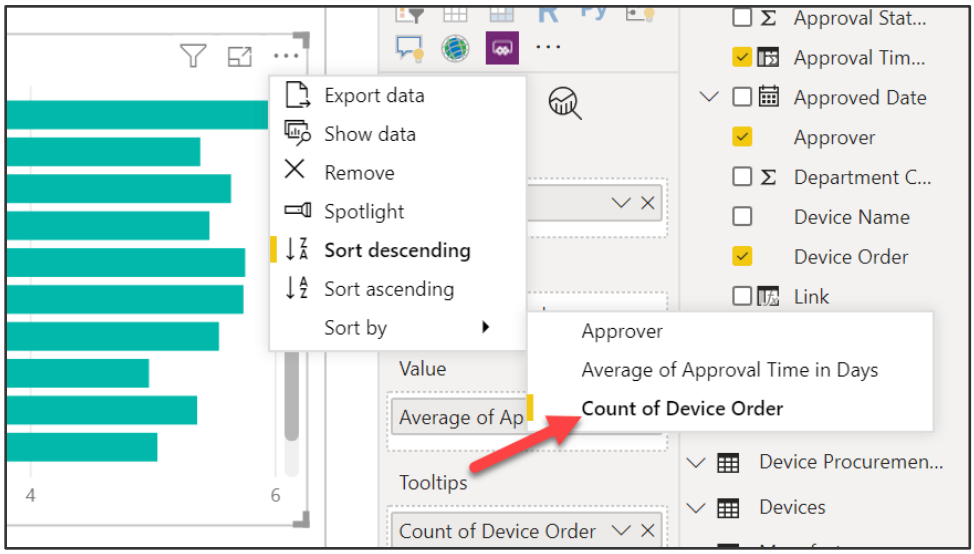
9. Click on the dropdown button next to the **Approval Time in Days**.



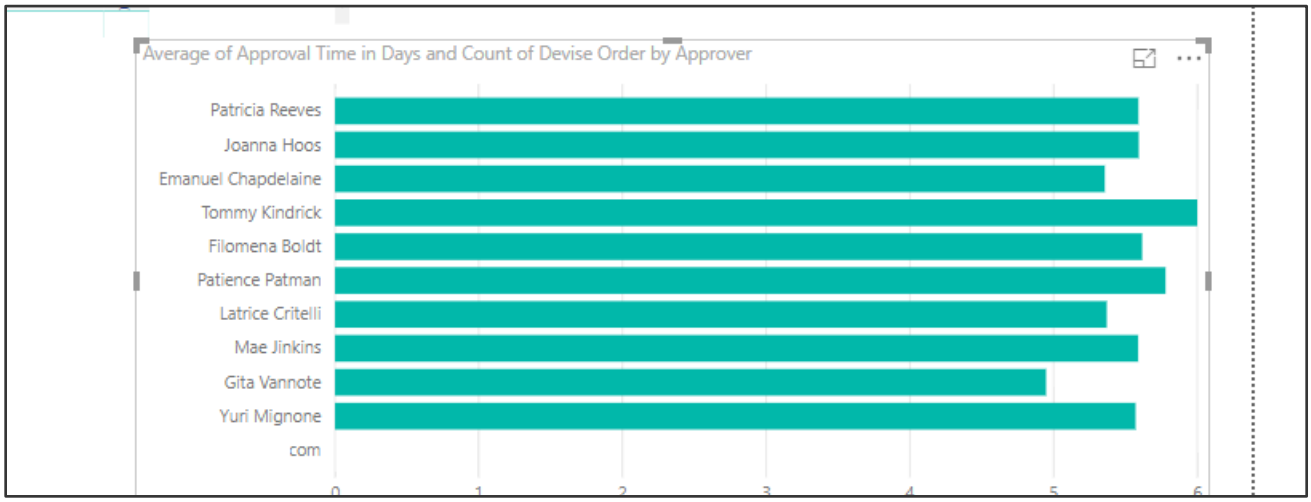
10. Select **Average**.



11. Click on the chart ellipses (the …), click Sort By, and select **Count of Device Order**.



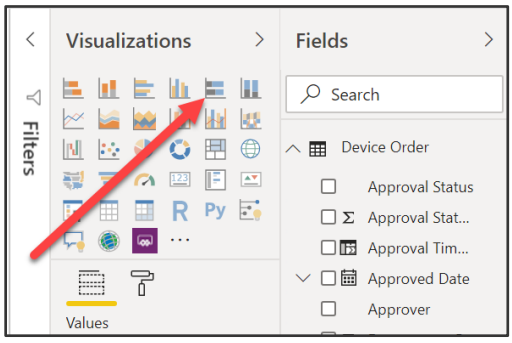
12. Your chart should now look like the image below.



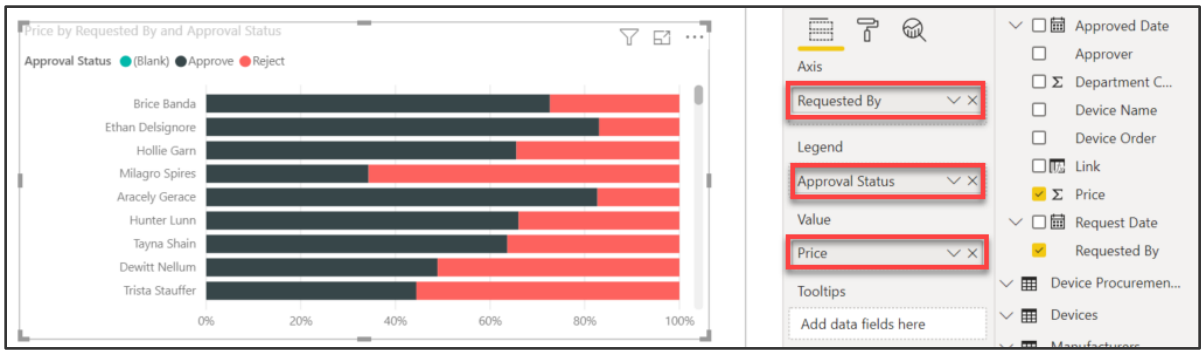
Exercise 5: Add visuals to the report

Task 1: Add Stacked Bar Chart of orders

1. Select an empty area of the canvas and click on the **Stacked Bar Chart**.

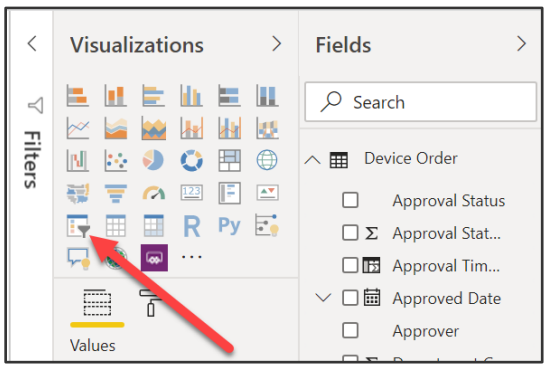


2. Select the columns below for the stacked bar chart.
   Requested By for **Axis**.
   Approval Status for **Legend**.
   Price for **Value**.
   Note: Your chart may not look the same based on how many rejected items you have in your data. You can edit the records in CDS and reject more if you want!

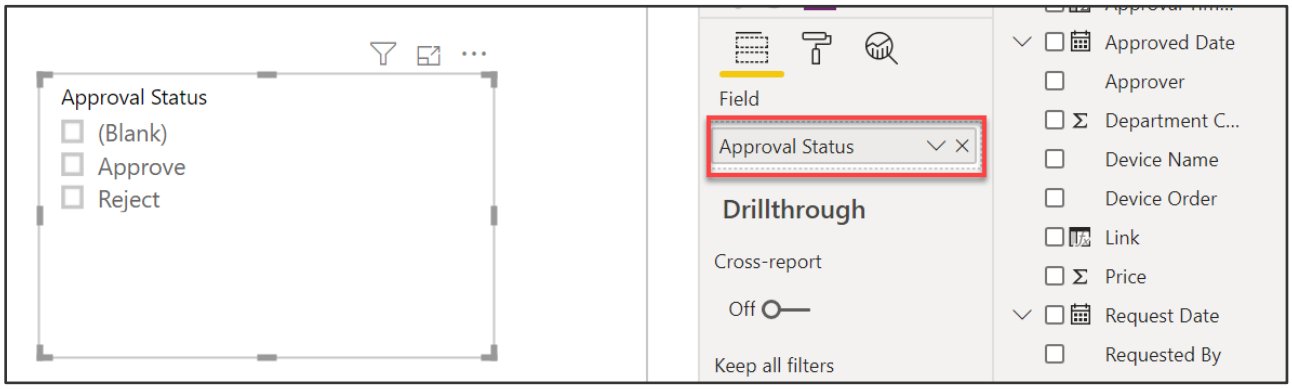


Task 2: Add a Slicer on Approval Status

1. Select an empty area of the canvas and click Slicer.

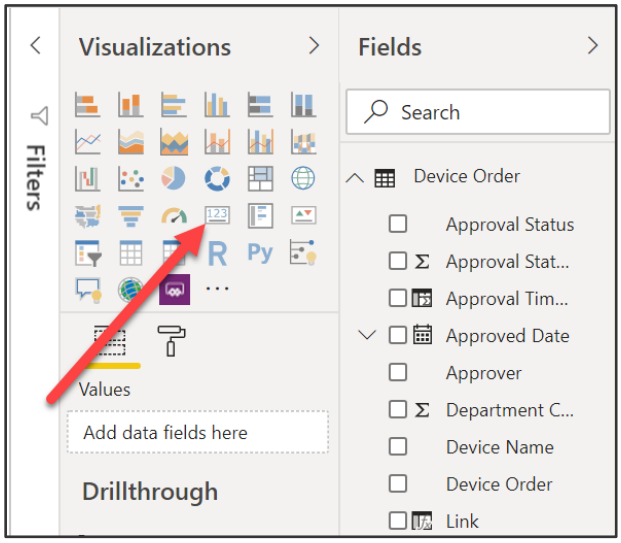


2. Drag the **Approval Status** to the **Field** target.

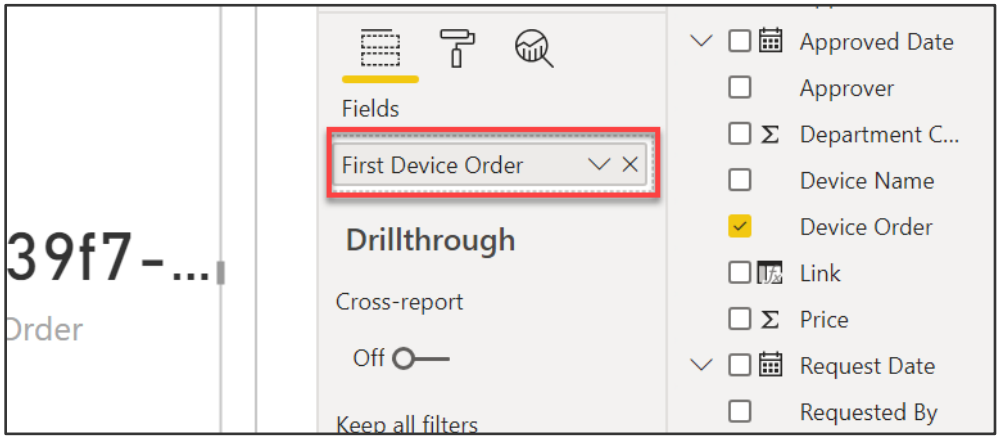


Task 3: Add Cards with Device Order statistics

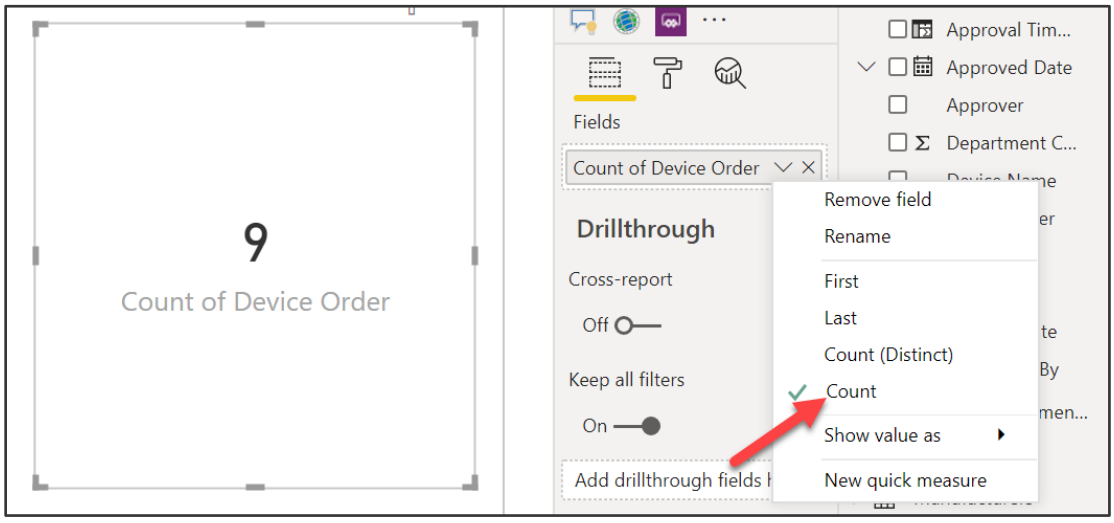
1. Select an empty area of the canvas and click Card.



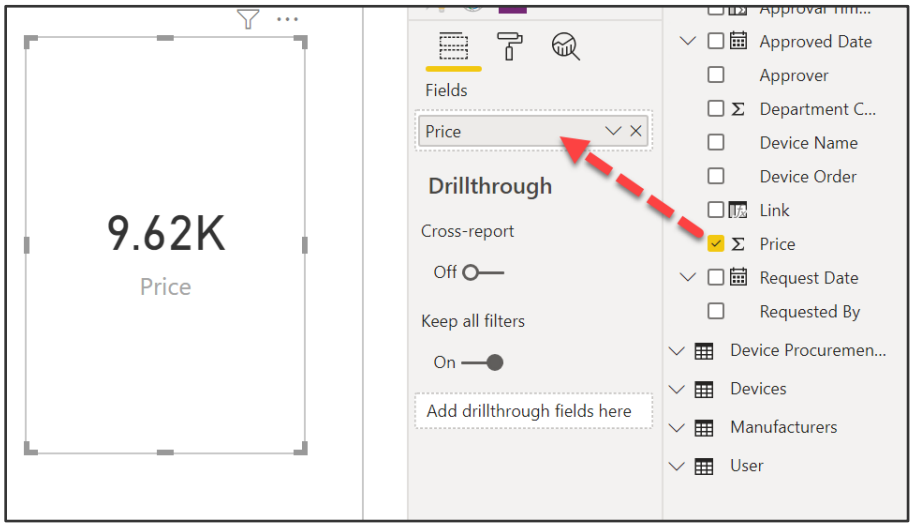
2. This card will show the total count of devices ordered. Select the card and drag **Device Order** to the **Fields** target.



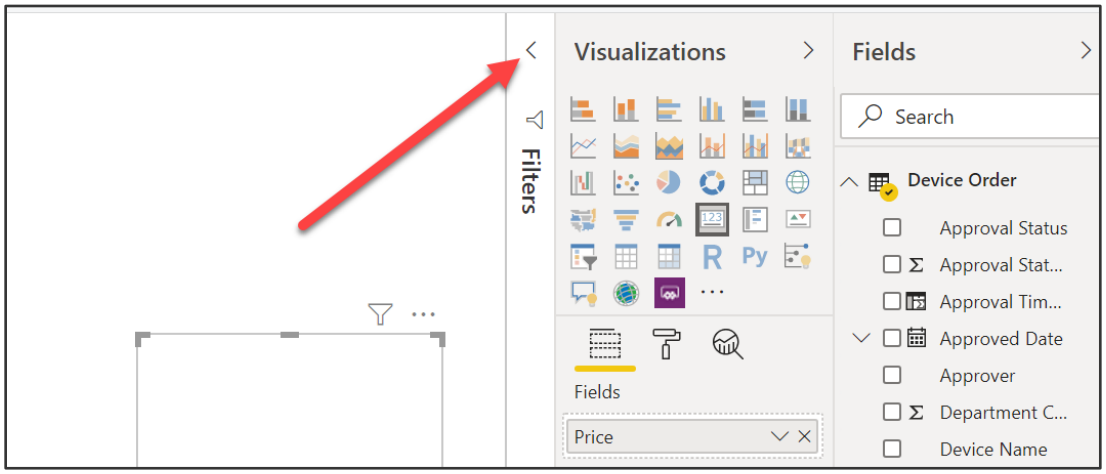
3. Select Count.



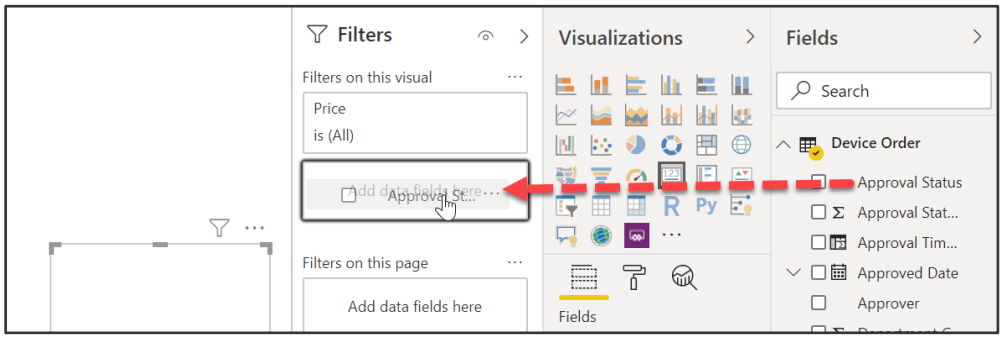
4. Add another Card to the canvas. This card will display total amount spent on approved devices.
5. Drag the **Price** to the **Fields** target



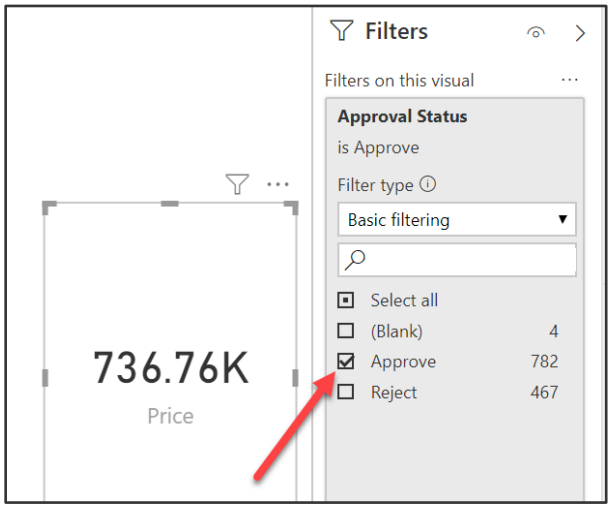
6. Click to expand the Filters pane.



7. Drag the **Approval Status** to the **Filters** on this Visual target.



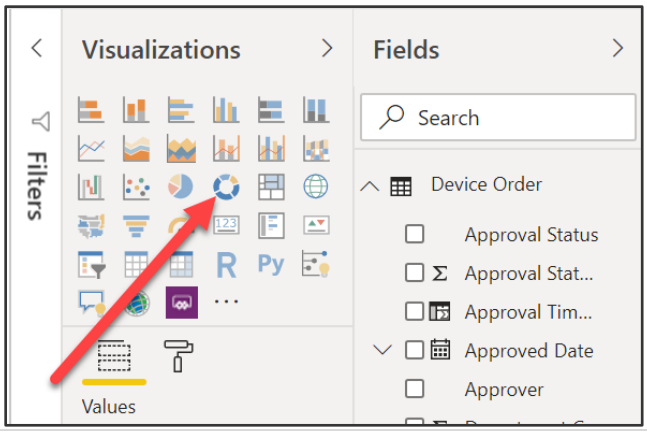
8. Select **Approve** to filter the amount only to those orders that are approved.



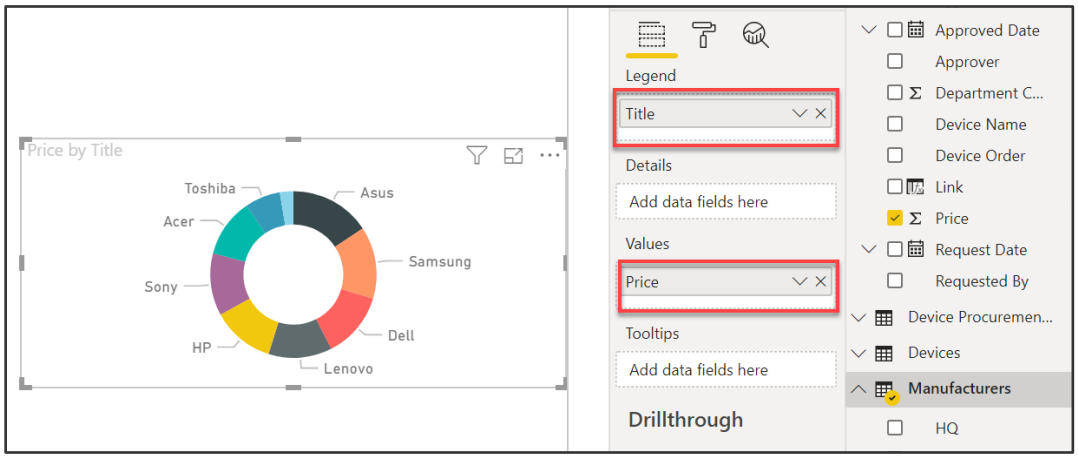
Task 4: Add a Donut Chart by Manufacture

In this task, you will add a Donut to represent the amount spent by manufacture. This can provide a quick visual way of allowing the CFO or other financial management staff to look at which manufactures they want to negotiate better pricing with. You can also click on a segment of the donut to filter the rest of the page to just that manufacture.

1. Add a Donut Chart to the canvas.

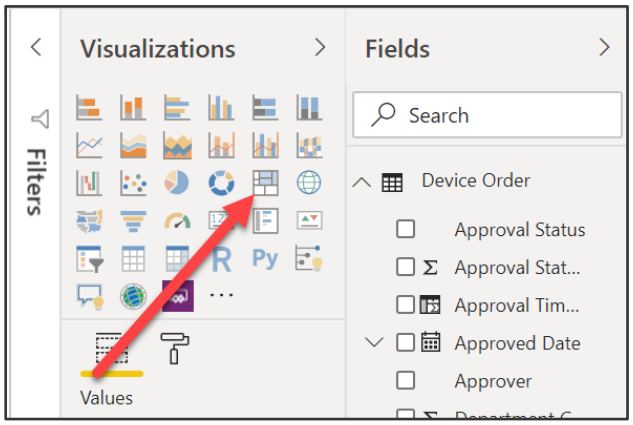


2. Drag **Title** from the **Manufacturers** table to the **Legend** target and **Price** from the **Devices** table to the **Values** target.

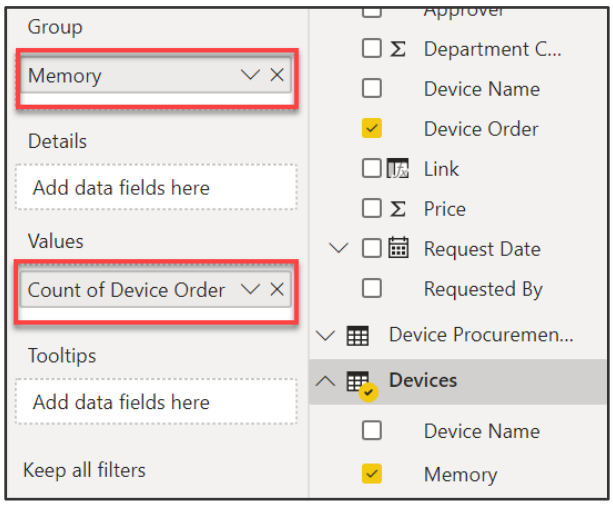


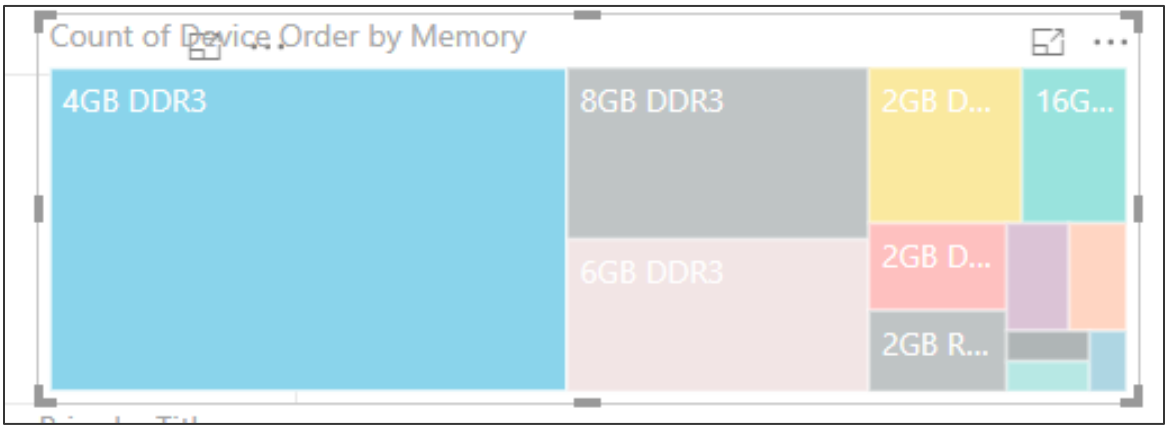
Task 5: Add a Tree Map by Device Name

1. Add Tree Map visual to the canvas.



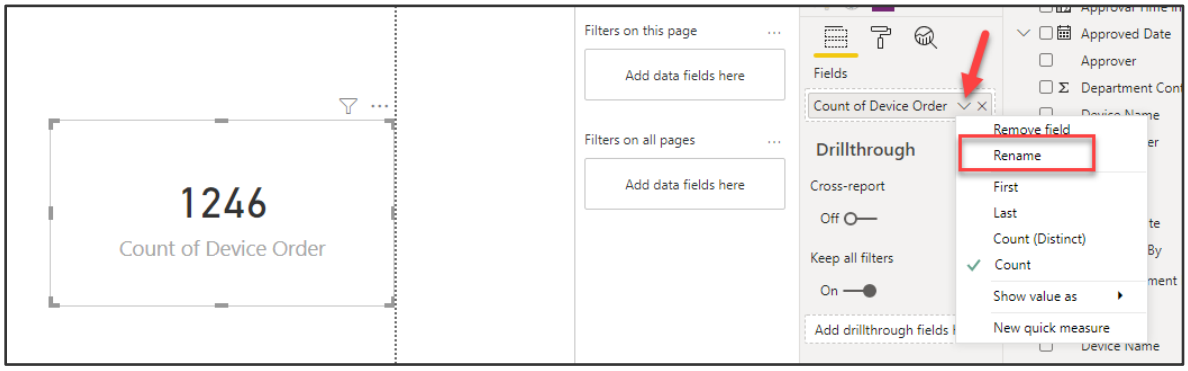
2. Drag **Memory** from the **Devices** table to the **Group target** and **Device Order** from **Device Order table** to the **Values** target.



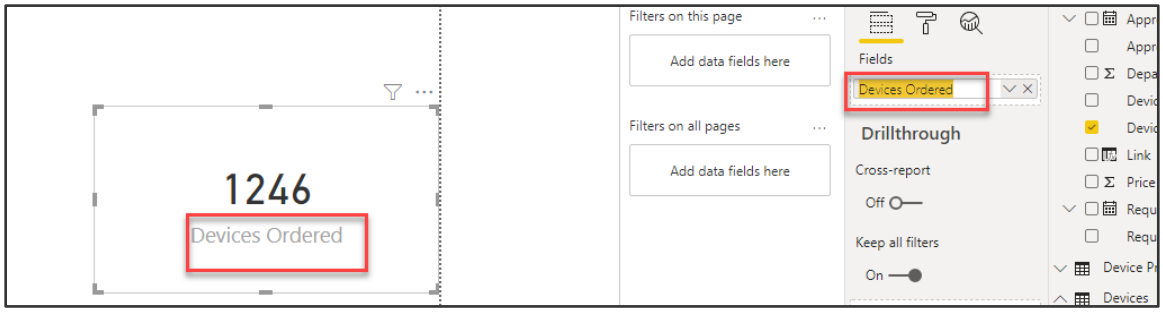


Task 6: Format the Statistics Cards

1. Select the **Count of Device Order** card and click **Rename**.



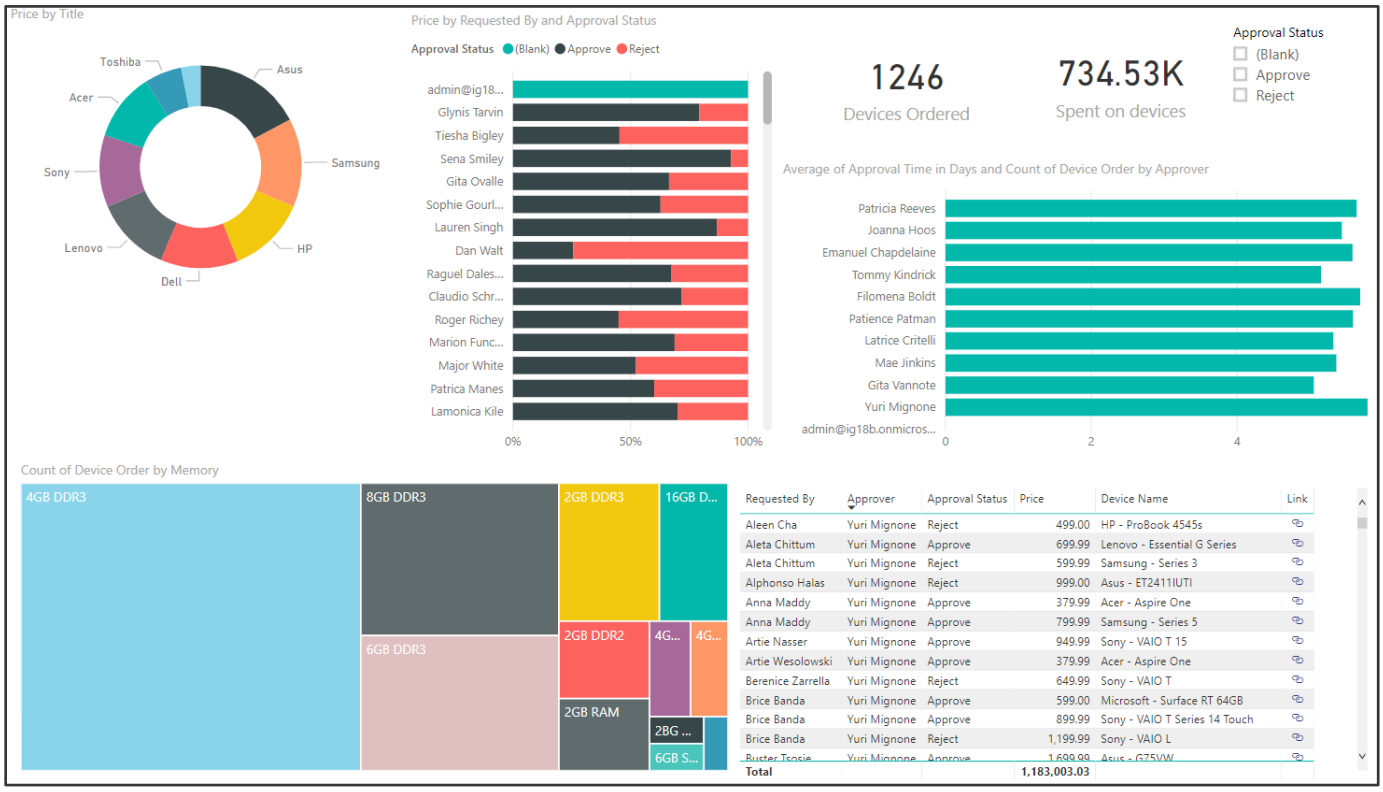
2. Rename it **Devices Ordered**.



3. You may rename other visuals as you see appropriate.

Task 7: Arrange the visuals on the report page

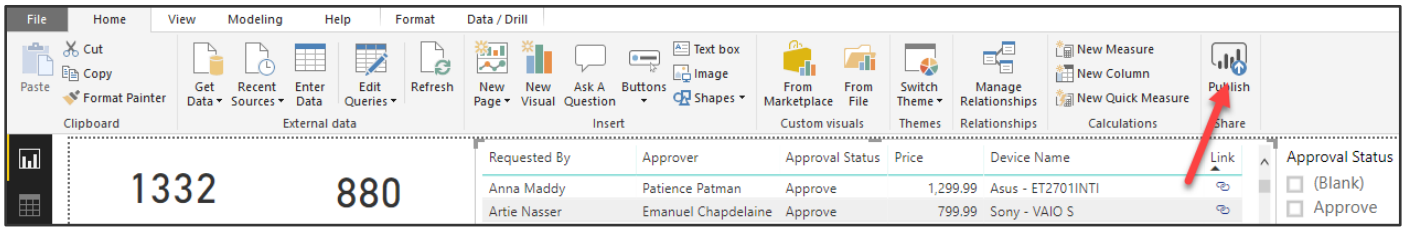
1. Arrange Visuals on the report page as shown in the image below.



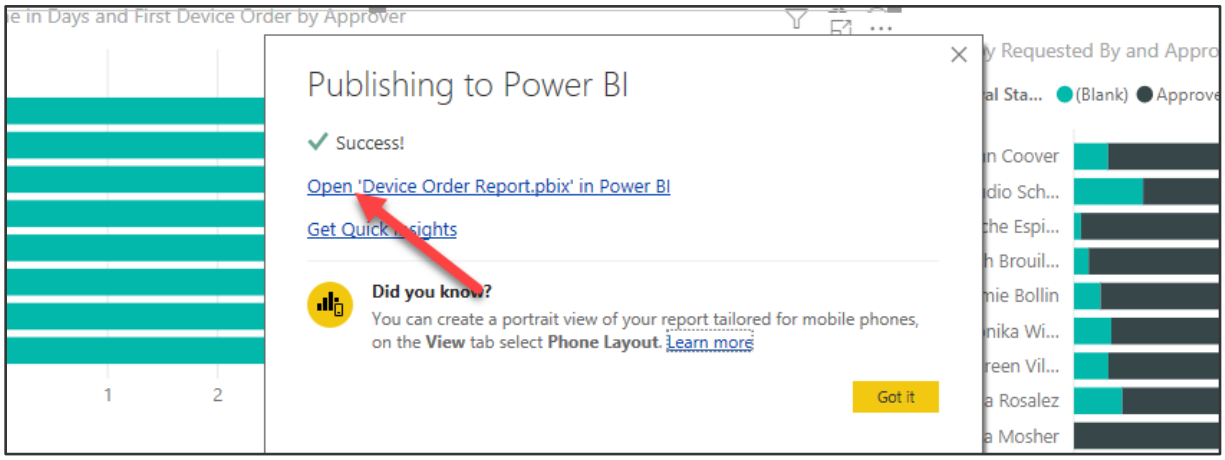
Exercise 6: Publish and Share

Task 1: Publish and Share

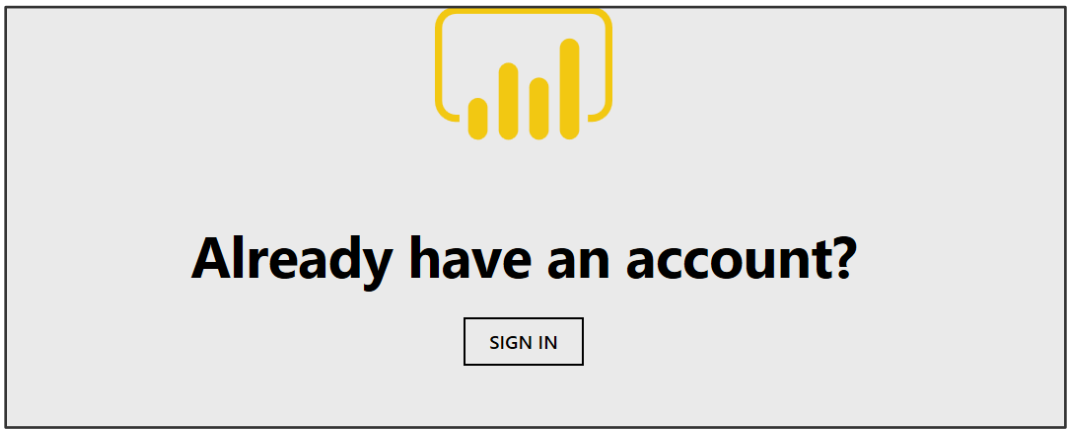
1. Make sure you are logged in in your environment.
2. Click **Save**.
3. Name the report **Device Order Report** and save it on your machine.
4. Click **Publish**.



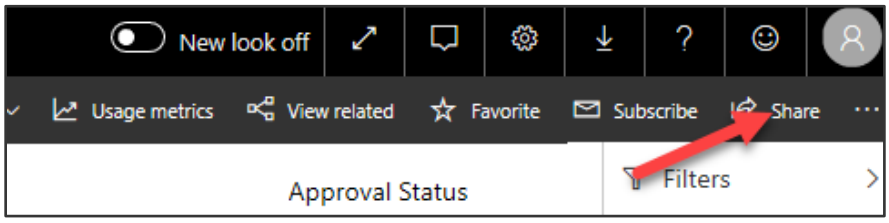
5. Click **Select** to select a workspace and wait for the publishing to complete
6. Click **Open in Power BI**.



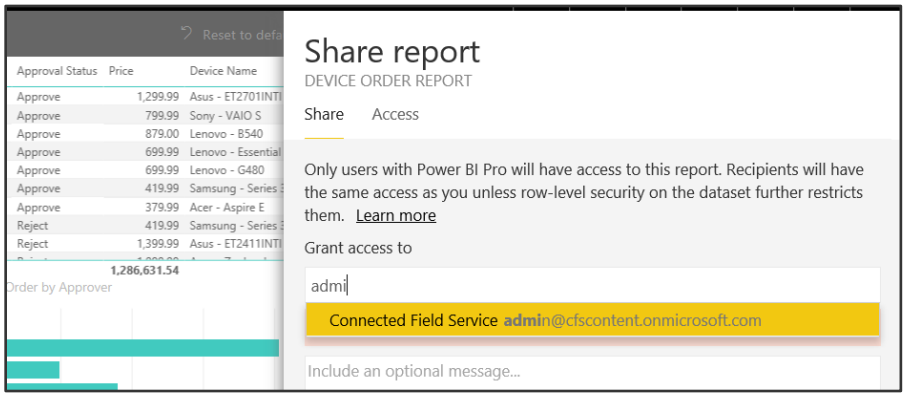
7. Click **Sign in**.



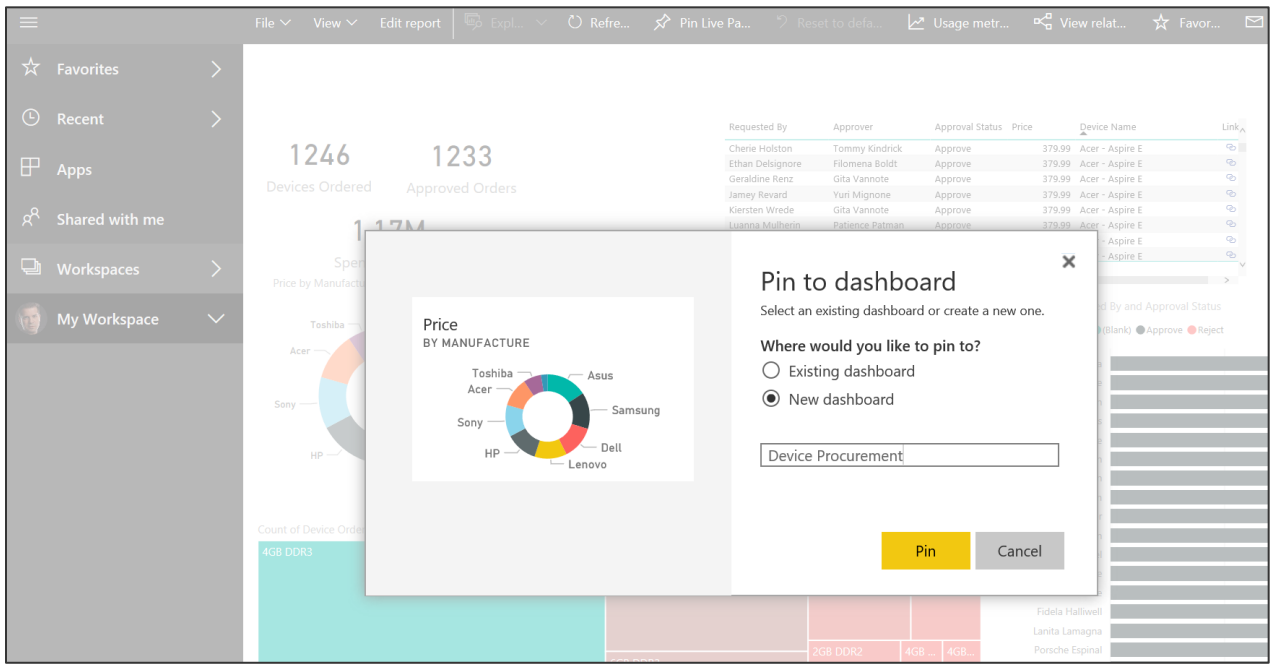
8. Click **Share**.



9. You can share with any user in your organization.



From within PowerBI.Com you can also add the report visualizations to an existing dashboard or create a new dashboard.



You can also embed the Power BI Visualizations in a personal dashboard in CDS. You can read more about that here [Power BI embed] if you have time give it a try!

Copyright

By using this demo/lab, you agree to the following terms:

The technology/functionality described in this demo/lab is provided by Microsoft Corporation for purposes of obtaining your feedback and to provide you with a learning experience. You may only use the demo/lab to evaluate such technology features and functionality and provide feedback to Microsoft. You may not use it for any other purpose. You may not modify, copy, distribute, transmit, display, perform, reproduce, publish, license, create derivative works from, transfer, or sell this demo/lab or any portion thereof.

COPYING OR REPRODUCTION OF THE DEMO/LAB (OR ANY PORTION OF IT) TO ANY OTHER SERVER OR LOCATION FOR FURTHER REPRODUCTION OR REDISTRIBUTION IS EXPRESSLY PROHIBITED.

THIS DEMO/LAB PROVIDES CERTAIN SOFTWARE TECHNOLOGY/PRODUCT FEATURES AND FUNCTIONALITY, INCLUDING POTENTIAL NEW FEATURES AND CONCEPTS, IN A SIMULATED ENVIRONMENT WITHOUT COMPLEX SET-UP OR INSTALLATION FOR THE PURPOSE DESCRIBED ABOVE. THE TECHNOLOGY/CONCEPTS REPRESENTED IN THIS DEMO/LAB MAY NOT REPRESENT FULL FEATURE FUNCTIONALITY AND MAY NOT WORK THE WAY A FINAL VERSION MAY WORK. WE ALSO MAY NOT RELEASE A FINAL VERSION OF SUCH FEATURES OR CONCEPTS. YOUR EXPERIENCE WITH USING SUCH FEATURES AND FUNCTIONALITY IN A PHYSICAL ENVIRONMENT MAY ALSO BE DIFFERENT.

FEEDBACK. If you give feedback about the technology features, functionality and/or concepts described in this demo/lab to Microsoft, you give to Microsoft, without charge, the right to use, share and commercialize your feedback in any way and for any purpose. You also give to third parties, without charge, any patent rights needed for their products, technologies and services to use or interface with any specific parts of a Microsoft software or service that includes the feedback. You will not give feedback that is subject to a license that requires Microsoft to license its software or documentation to third parties because we include your feedback in them. These rights survive this agreement.

MICROSOFT CORPORATION HEREBY DISCLAIMS ALL WARRANTIES AND CONDITIONS WITH REGARD TO THE DEMO/LAB, INCLUDING ALL WARRANTIES AND CONDITIONS OF MERCHANTABILITY, WHETHER EXPRESS, IMPLIED OR STATUTORY, FITNESS FOR A PARTICULAR PURPOSE, TITLE AND NON-INFRINGEMENT. MICROSOFT DOES NOT MAKE ANY ASSURANCES OR REPRESENTATIONS WITH REGARD TO THE ACCURACY OF THE RESULTS, OUTPUT THAT DERIVES FROM USE OF DEMO/ LAB, OR SUITABILITY OF THE INFORMATION CONTAINED IN THE DEMO/LAB FOR ANY PURPOSE.

DISCLAIMER

This demo/lab contains only a portion of new features and enhancements in Microsoft Power Apps. Some of the features might change in future releases of the product. In this demo/lab, you will learn about some, but not all, new features.