Dashboard in a Day – Lab 3
Data Visualization

by Power BI Team, Microsoft

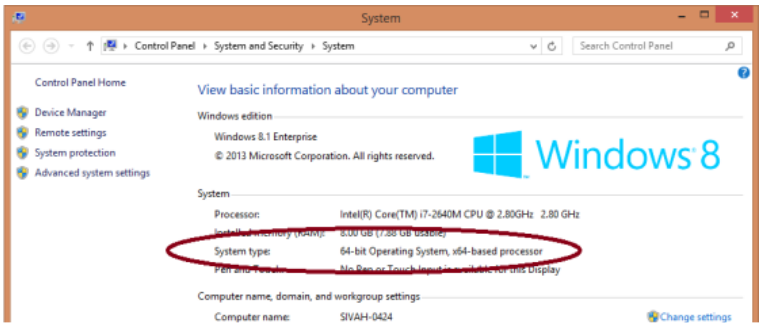
Maintained by: Microsoft Corporation

Contents

Lab Prerequisites

Following prerequisites and setup must be complete for successful completion of the exercise:

- You must be connected to the internet.
- You must have Microsoft Office installed.
- **Signup for Power BI:** Go to http://aka.ms/pbidiadtraining and sign up for Power BI with a business email address. If you cannot sign up for Power BI, let the instructor know. If you have an existing account, please use the same url as above.
- At minimum, a computer with 2-cores and 4GB RAM running one of the following versions of Windows: Windows 8 / Windows Server 2008 R2, or later.
- If you choose to use Internet Explorer it will require version 10 or greater, you can also use Edge or Chrome.
- Verify if you have 32-bit or 64-bit operating system to decide if you need to install the 32-bit or 64-bit applications.
    - Search for computer on your PC, right click properties for your computer.
    - You will be able to identify if your operating system is 64 or 32 bit based on "system type" as shown below.



- **Download the Power BI Content:** Create a folder called **DIAD** on the C drive of your local machine. Copy all contents from the folder called **Dashboard in a Day Assets** to the **DIAD** folder you just created (C:\DIAD).
- **Download and install Power BI Desktop** using any one of the options listed below:
    - If you have Windows 10, use Microsoft App Store to download and install Power BI Desktop app.
    - Download and install Microsoft Power BI Desktop from http://www.microsoft.com/en-us/download/details.aspx?id=45331.
    - If you already have Power BI Desktop installed ensure you have the **latest version** of Power BI downloaded**.**
- **Download and install Power BI Mobile App on your mobile device**
    - If you are using an Apple product download and install the Microsoft Power BI Mobile app from the Apple store or this link https://apps.apple.com/us/app/microsoft-power-bi/id929738808
    - If you are using an Android product download and install the Microsoft Power BI Mobile app from the Google Play store or this link https://play.google.com/store/apps/details?id=com.microsoft.powerbim

Document Structure

This document is lab 03 of 05 labs in total.

If you are joining the DIAD at this point or were unable to complete previous labs, please start this lab with the provided: “Lab 2 solution.pbix” file you can find in the Reports folder.

At the end of this lab you will have completed a full report that is ready to be published to Power BI Service. In the report you will have learned how to do conditional formatting, added a logo to the manufacturer filter, imported a custom visual as well as applied a custom theme to the report. At the end you will also learned how to add bookmarks to tell a story about the report.

The document flow is in a table format. On the left panel are steps the user needs to follow and in the right panel are screenshots to provide a visual aid for the users. In the screenshots, sections are highlighted with red boxes to highlight the action/area user needs to focus on.

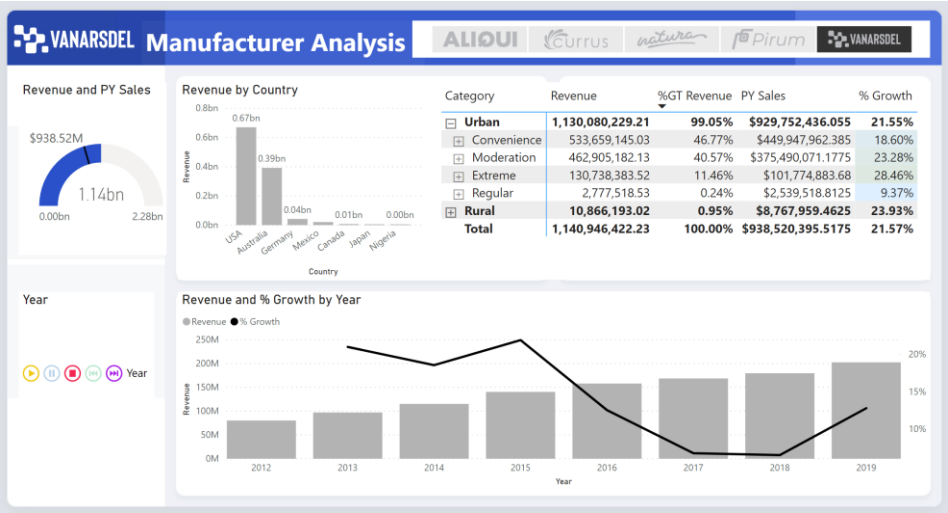
NOTE: This lab is using real anonymized data and is provided by ObviEnce LLC. Visit their site to learn about their services: www.obvience.com .
This data is property of ObviEnce LLC and has been shared for the purpose of demonstrating Power BI functionality with industry sample data. Any uses of this data must include this attribution to ObviEnce LLC.

Power BI Desktop

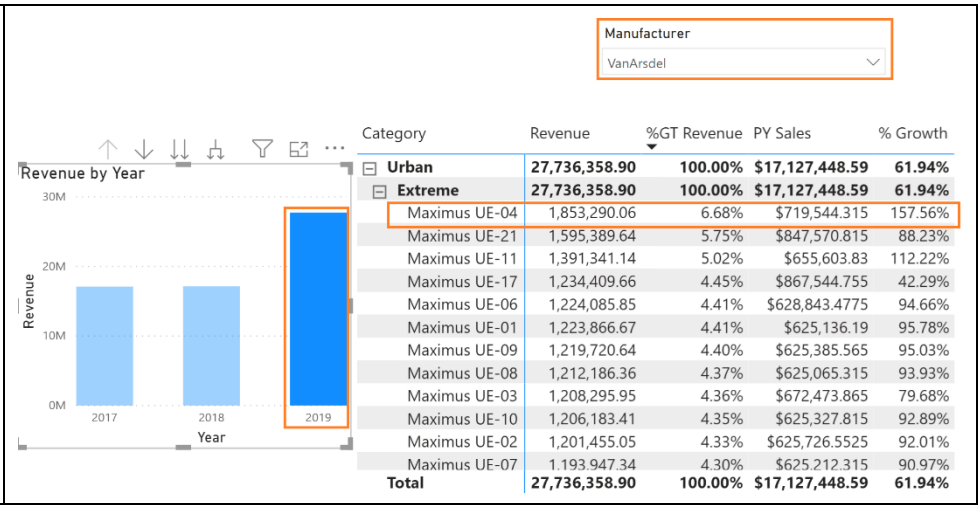
Power BI Desktop – Data Visualization

Having done the data exploration and visualization you have found good insights to share with your team. In this section, you will create a professional report from which you and your entire team can benefit.

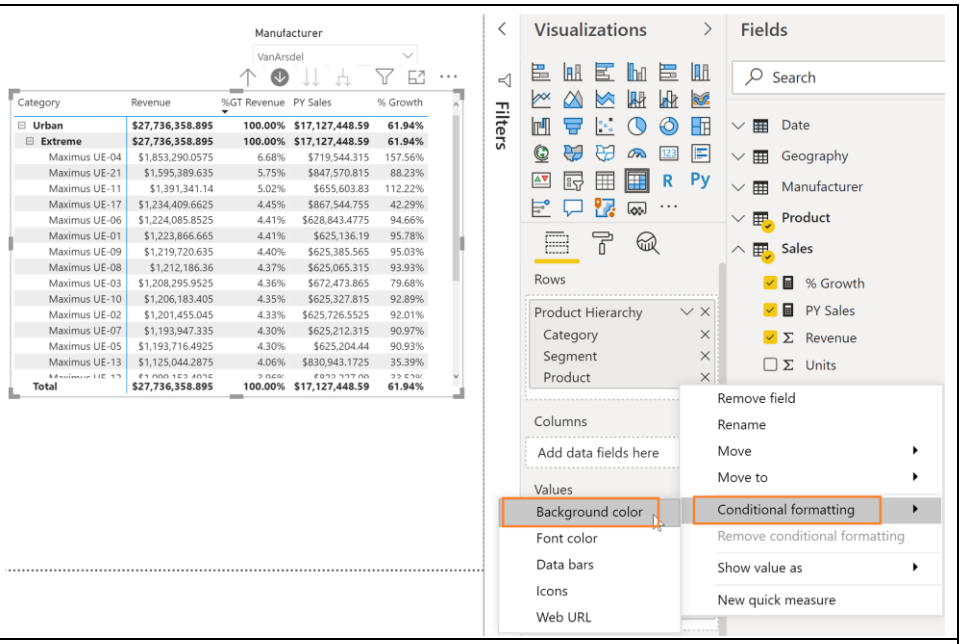
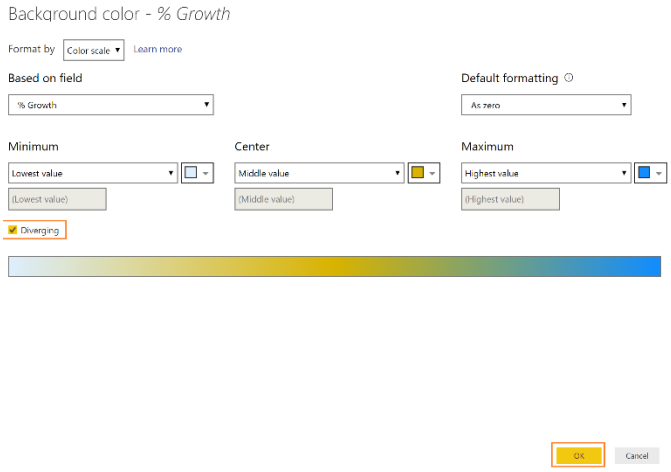
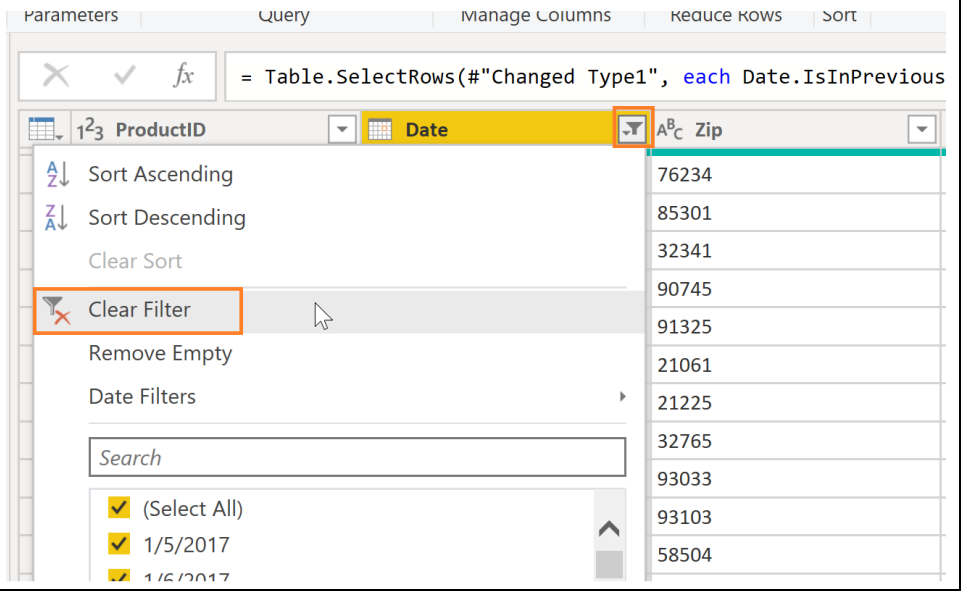
At the end of this section, you will build a report like the one shown in the screenshot.

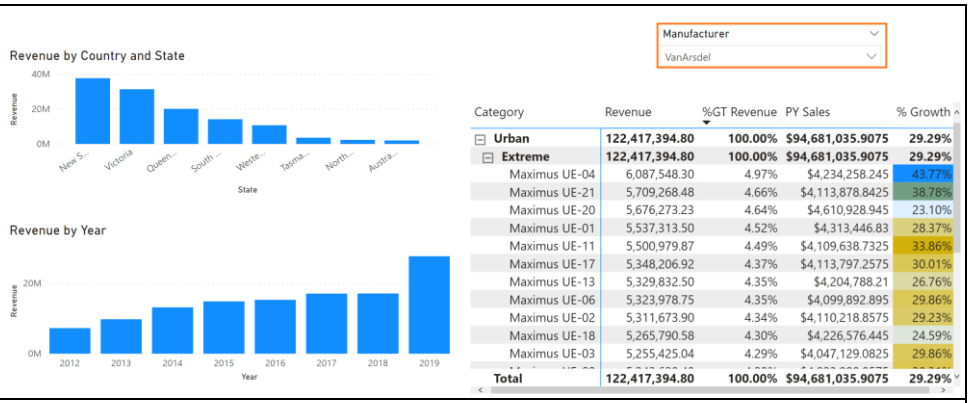
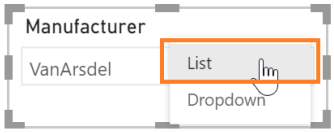
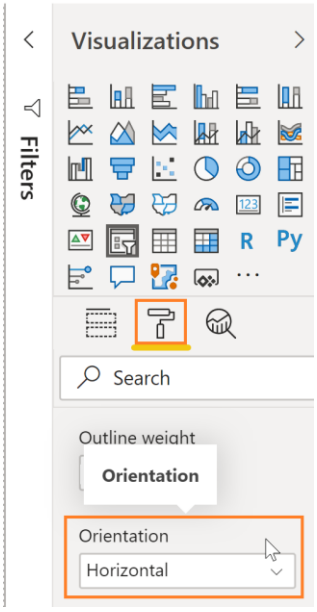


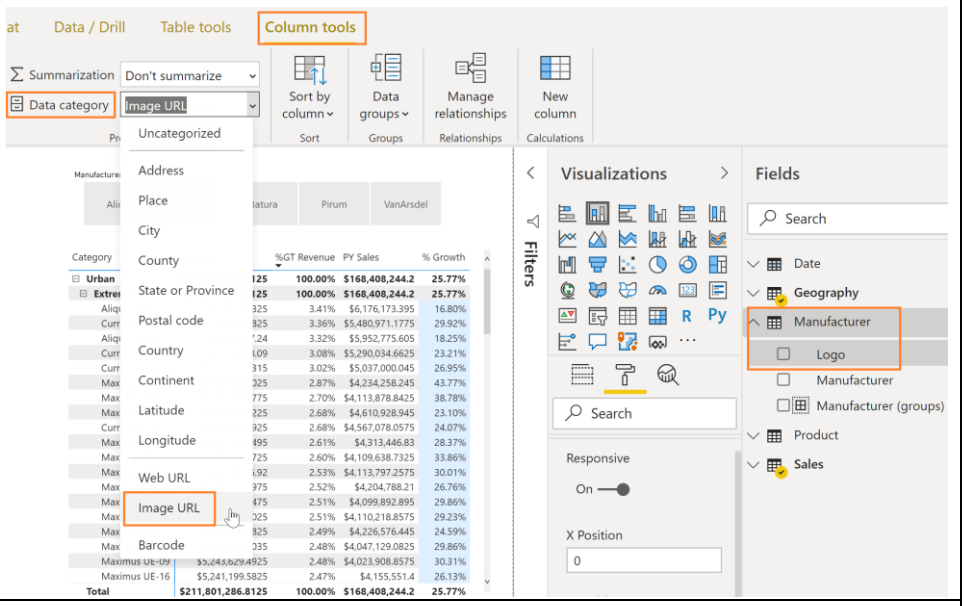
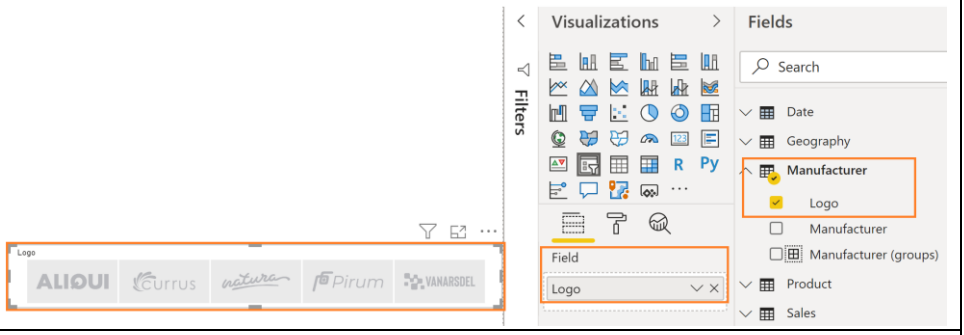
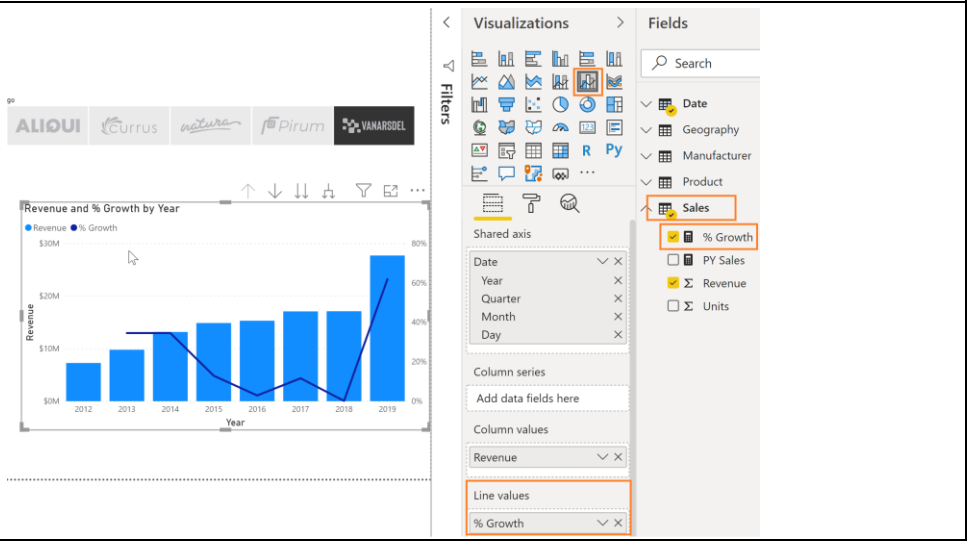
Category	Revenue	%GT Revenue	PY Sales	% Growth
Urban	**1,130,080,229.21**	**99.05%**	**$929,752,436.055**	**21.55%**
Convenience	533,659,145.03	46.77%	$449,947,962.385	18.60%
Moderation	462,905,182.13	40.57%	$375,490,071.1775	23.28%
Extreme	130,738,383.52	11.46%	$101,774,883.68	28.46%
Regular	2,777,518.53	0.24%	$2,539,518.8125	9.37%
Rural	**10,866,193.02**	**0.95%**	**$8,767,959.4625**	**23.93%**
Total	**1,140,946,422.23**	**100.00%**	**$938,520,395.5175**	**21.57%**

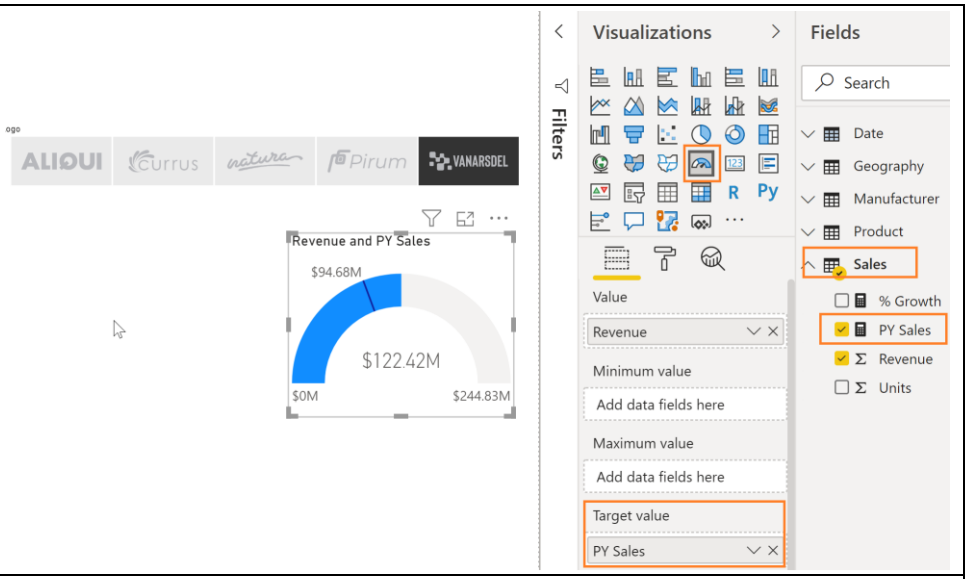
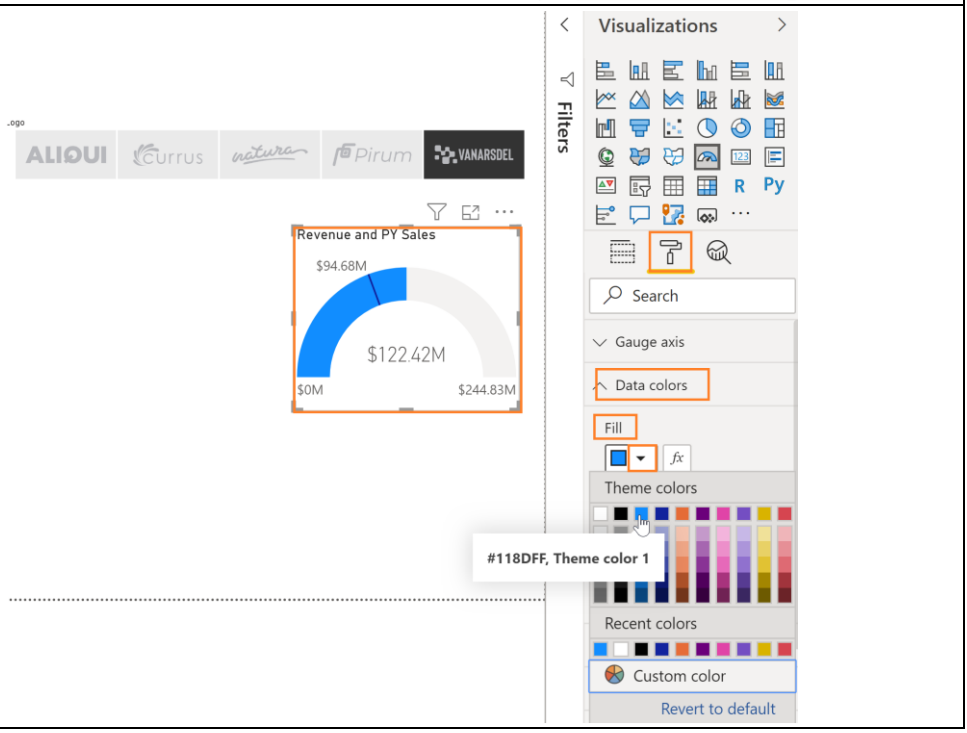
1. From the last step of Lab 2 refer to the visual on the right before moving on.	

Category	Revenue	%GT Revenue	PY Sales	% Growth
Urban	**27,736,358.90**	**100.00%**	**$17,127,448.59**	**61.94%**
Extreme	**27,736,358.90**	**100.00%**	**$17,127,448.59**	**61.94%**
Maximus UE-04	1,853,290.06	6.68%	$719,544.315	157.56%
Maximus UE-21	1,595,389.64	5.75%	$847,570.815	88.23%
Maximus UE-11	1,391,341.14	5.02%	$655,603.83	112.22%
Maximus UE-17	1,234,409.66	4.45%	$867,544.755	42.29%
Maximus UE-06	1,224,085.85	4.41%	$628,843.4775	94.66%
Maximus UE-01	1,223,866.67	4.41%	$625,136.19	95.78%
Maximus UE-09	1,219,720.64	4.40%	$625,385.565	95.03%
Maximus UE-08	1,212,186.36	4.37%	$625,065.315	93.93%
Maximus UE-03	1,208,295.95	4.36%	$672,473.865	79.68%
Maximus UE-10	1,206,183.41	4.35%	$625,327.815	92.89%
Maximus UE-02	1,201,455.05	4.33%	$625,726.5525	92.01%
Maximus UE-07	1,193,947.34	4.30%	$625,212.315	90.97%
Total	**27,736,358.90**	**100.00%**	**$17,127,448.59**	**61.94%**

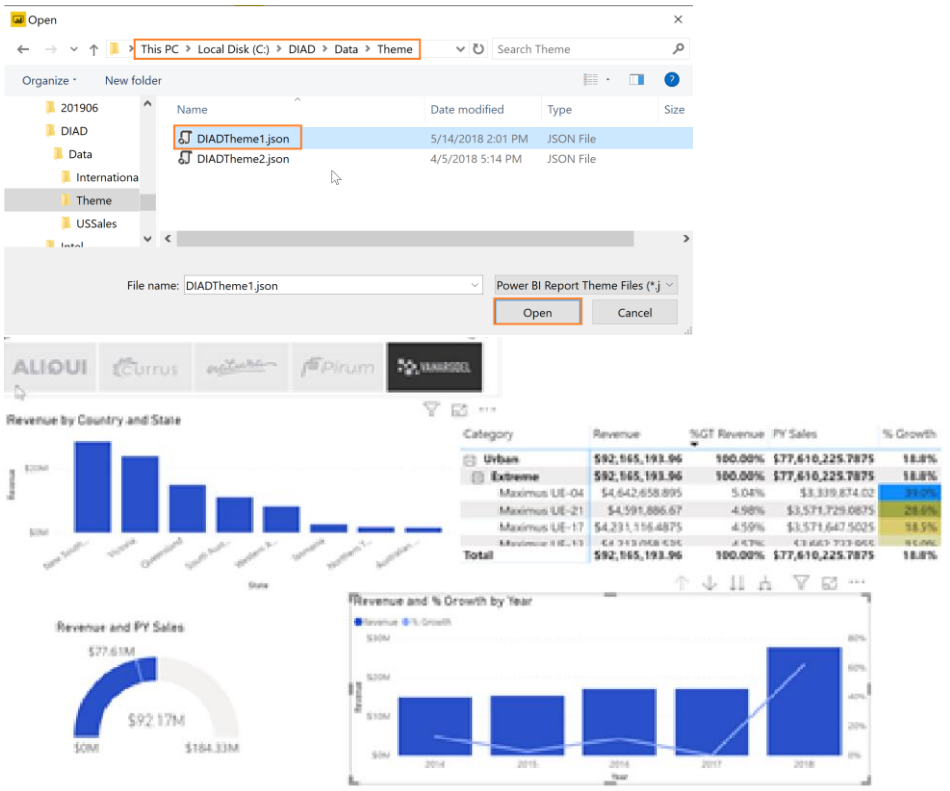
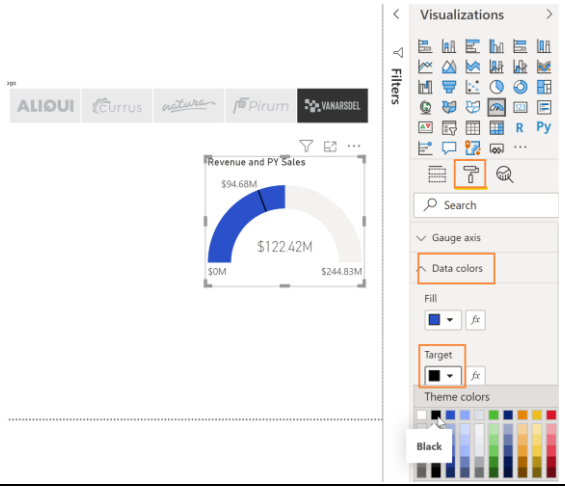
2. With **Matrix** visual selected, from the **Values** section, select the arrow next to **% Growth**. 3. Select **Conditional Formatting -> Background Color.**	
Background color dialog opens. This dialog provides options to format background color either using rules or diverging colors. 4. Select the **Diverging** checkbox. 5. Select **OK**. **Note:** Conditional formatting can also be based on another column using **Color based on** drop down.	
Initially we added a filter to load 3 years of data. Let's load the complete data. 6. From the **ribbon**, select **Home -> Transform Data**. Power Query Editor window opens. 7. Select the **filter** button on the **Date** column. 8. Select **Clear filter** to remove the 3-year filter. 9. Select **Home -> Close & Apply** to load the data. 10. Sales data is reloaded, this time all the data is loaded. It might take a couple of minutes as we are loading ~7 million rows.	

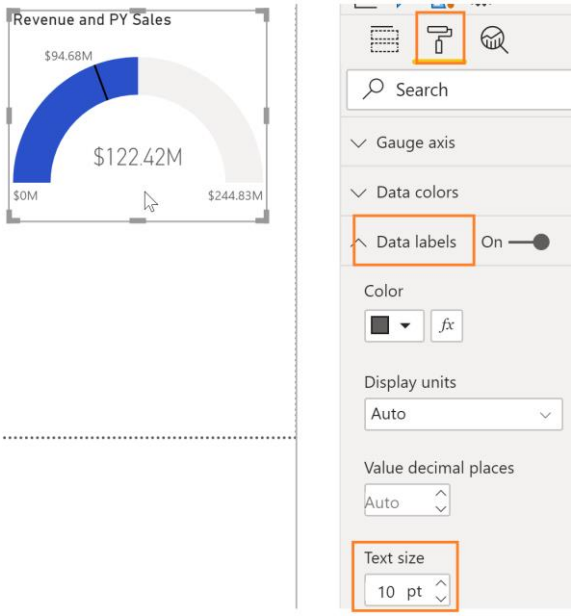
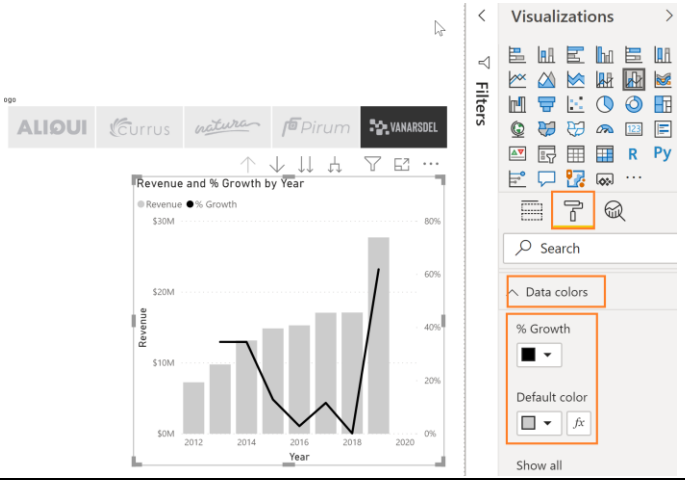
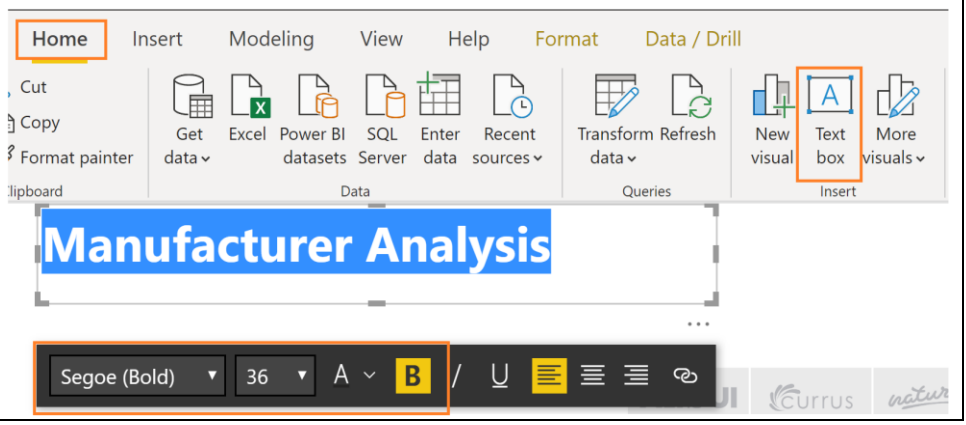
Make sure the report is filtered by VanArsdel using Manufacturer slicer. Remove all other filters. At this point your report page should look something like the screenshot. Once data is loaded, notice **Revenue by Year visual**. You will see columns for years 2012 through 2019.	 Category | Revenue | %GT Revenue | PY Sales | % Growth Urban 122,417,394.80 100.00% $94,681,035.9075 29.29% Extreme 122,417,394.80 100.00% $94,681,035.9075 29.29% Maximus UE-04 6,087,548.30 4.97% $4,234,258.245 43.77% Maximus UE-21 5,709,268.48 4.66% $4,113,878.8425 38.78% Maximus UE-20 5,676,273.23 4.64% $4,610,928.945 23.10% Maximus UE-01 5,537,313.50 4.52% $4,313,446.83 28.37% Maximus UE-11 5,500,979.87 4.49% $4,109,638.7325 33.86% Maximus UE-17 5,348,206.92 4.37% $4,113,797.2575 30.01% Maximus UE-13 5,329,832.50 4.35% $4,204,788.21 26.76% Maximus UE-06 5,323,978.75 4.35% $4,099,892.895 29.86% Maximus UE-02 5,311,673.90 4.34% $4,110,218.8575 29.23% Maximus UE-18 5,265,790.58 4.30% $4,226,576.445 24.59% Maximus UE-03 5,255,425.04 4.29% $4,047,129.0825 29.86% Total 122,417,394.80 100.00% $94,681,035.9075 29.29%
11. Hover over **Manufacturer slicer visual**. 12. On the top right corner select the **arrow**. 13. Select **List**. 14. in **VISUALIZATIONS** panel select the paint roller icon. This opens the formatting options available for a visual. 15. **Expand General** section, select **Horizontal** from the **Orientation** dropdown. 16. Notice the Slicer visual is updated. You can **resize** the visual, so all the manufacturers are listed horizontally. **Note**: There are other options to change the Outline color, weight, etc. 17. Select **VanArsdel**. 18. **Collapse General** section. 19. **Note**: Expand Selection Controls section. Notice there is an option to enable Select All option in the visual. There is also an option to make the slicer multi select. Feel free to explore other formatting options.	  Category | Revenue | %GT Revenue | PY Sales | % Growth Urban $211,801,286.8125 100.00% $168,408,244.2 25.77% Extreme $211,801,286.8125 100.00% $168,408,244.2 25.77% Aliqui UE-05 $7,213,619.3325 3.41% $6,176,173.395 16.80% Currus UE-05 $7,120,926.3825 3.36% $5,480,971.1775 29.92% Aliqui UE-06 $7,038,957.24 3.32% $5,952,775.605 18.25% Currus UE-15 $6,518,028.09 3.08% $5,290,034.6625 23.21% Currus UE-14 $6,394,479.315 3.02% $5,037,000.045 26.95% Maximus UE-04 $6,087,548.3025 2.87% $4,234,258.245 43.77% Maximus UE-21 $5,709,268.4775 2.70% $4,113,878.8425 38.78% Maximus UE-20 $5,676,273.225 2.68% $4,610,928.945 23.10% Currus UE-24 $5,666,546.3925 2.68% $4,567,078.0575 24.07% Maximus UE-01 $5,537,313.495 2.61% $4,313,446.83 28.37% Maximus UE-11 $5,500,979.8725 2.60% $4,109,638.7325 33.86% Maximus UE-17 $5,348,206.92 2.53% $4,113,797.2575 30.01% Maximus UE-13 $5,329,832.4975 2.52% $4,204,788.21 26.76% Maximus UE-06 $5,323,978.7475 2.51% $4,099,892.895 29.86% Maximus UE-02 $5,311,673.9025 2.51% $4,110,218.8575 29.23% Maximus UE-18 $5,265,790.5825 2.49% $4,226,576.445 24.59% Maximus UE-03 $5,255,425.035 2.48% $4,047,129.0825 29.86% Maximus UE-09 $5,243,629.4925 2.48% $4,023,908.8575 30.31% 

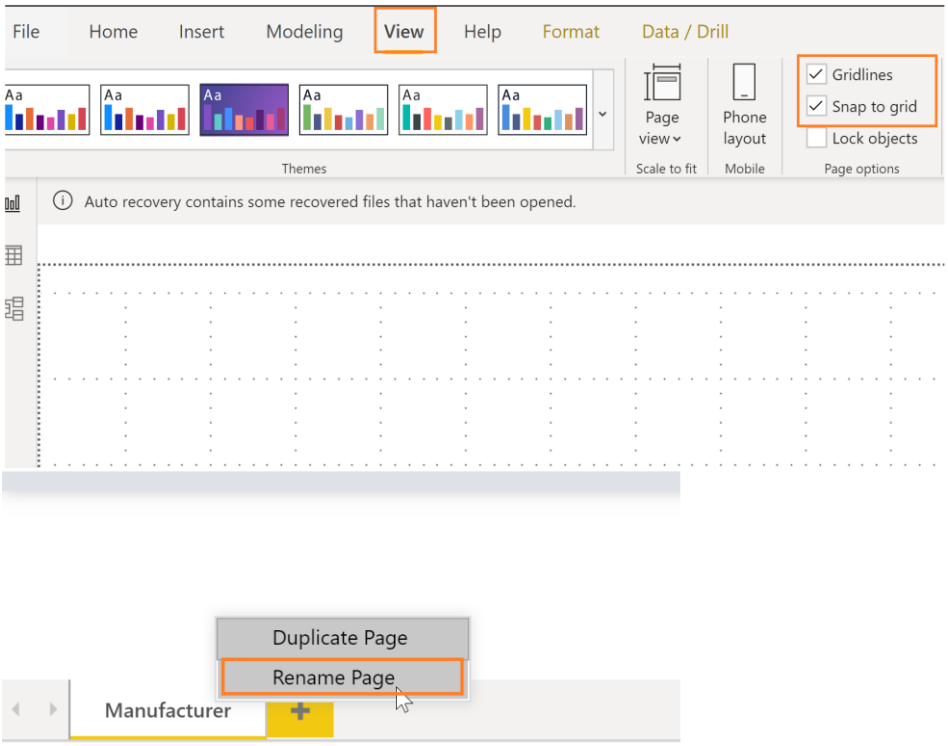
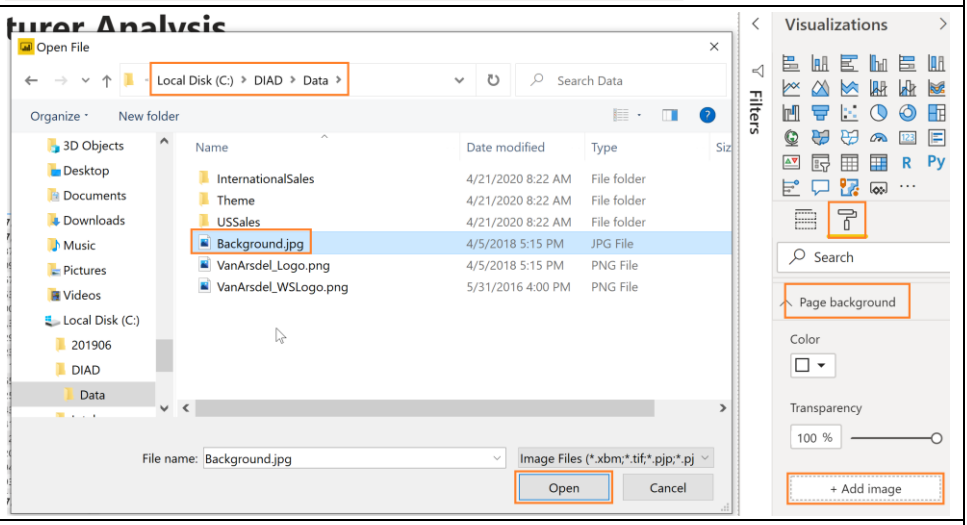
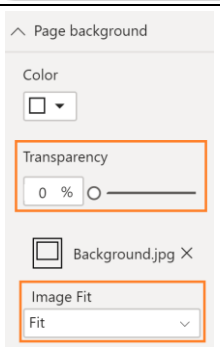
It will be nice to add logos of the manufacturer to the slicer. Let's do it. 20. From **FIELDS** section, select **Logo** field from **Manufacturer** table. 21. From the ribbon, select **Column tools -> Data Category -> Image URL.** Setting data category to Image URL helps Power BI to understand that it is a URL and it can access the data.	
22. From the canvas, select **Manufacturer slicer**. 23. From **FIELDS** section, drag and drop **Logo** from **Manufacturer** table to Field box replacing the Manufacturer column. 24. **Resize** slicer visual as needed. 25. **Select VanArsdel** logo to filter all the other visuals.	
26. Select **Revenue by Year** visual. 27. From **VISUALIZATIONS** panel, select **Line and clustered column chart** to change the visual type. 28. From **FIELDS** section, drag and drop **% Growth** field from **Sales** table to **Line values**. This provides a representation of the revenue and growth over time.	

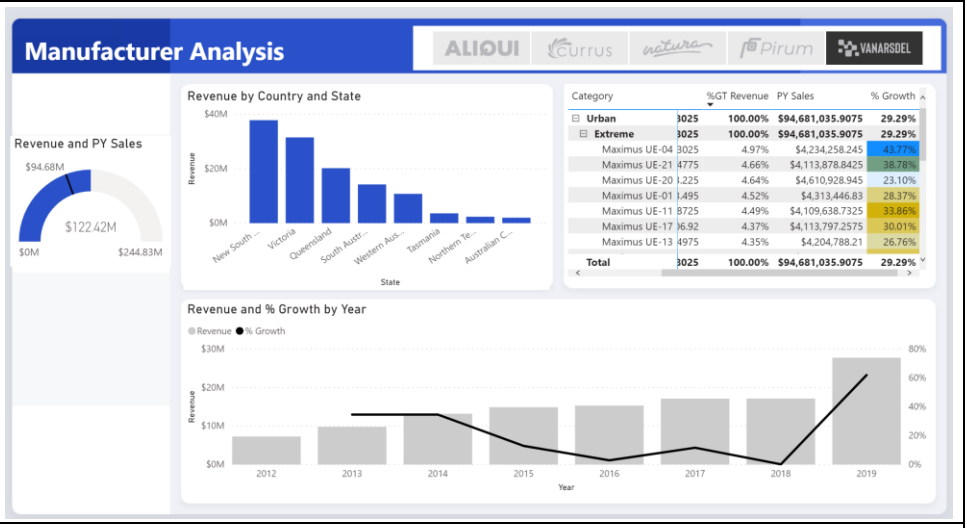
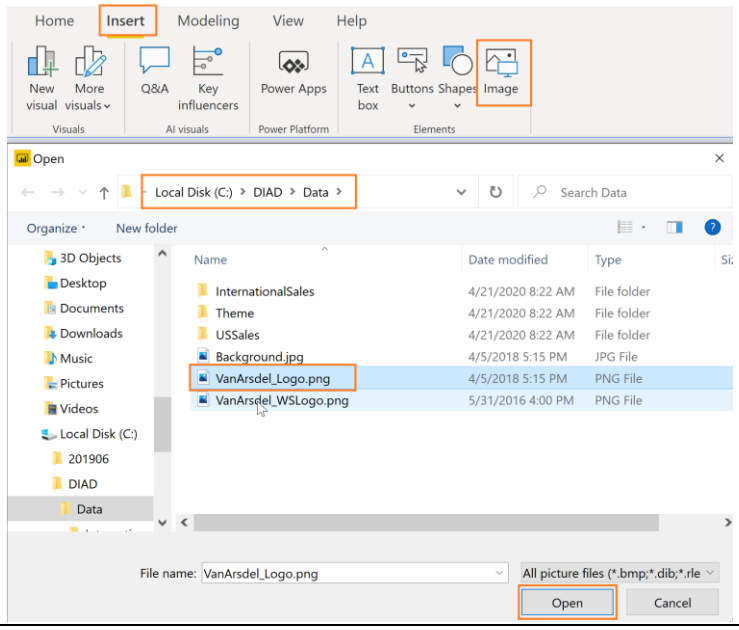
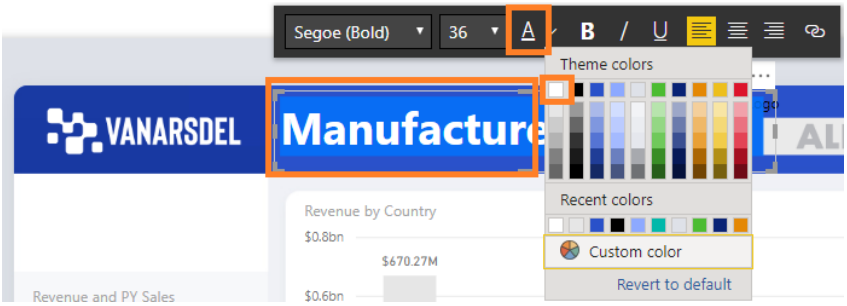
29. Select **Revenue Card** visual. Let's change this to a Gauge visual. 30. From **VISUALIZATIONS** panel, select the **Gauge** visual. 31. From **FIELDS** section, drag and drop **PY Sales** field to **Target value**. **Resize** the visual as needed. Now we can compare Revenue with the target.	
It will be nice to change the colors on the visuals. 32. Select **Gauge** visual. 33. From **VISUALIZATIONS** panel, select **paint roller** icon. 34. Expand **Data Colors** section. 35. Select the **arrow** next to **Fill** color. 36. Notice you can pick a color from the default color palette or pick Custom colors.	

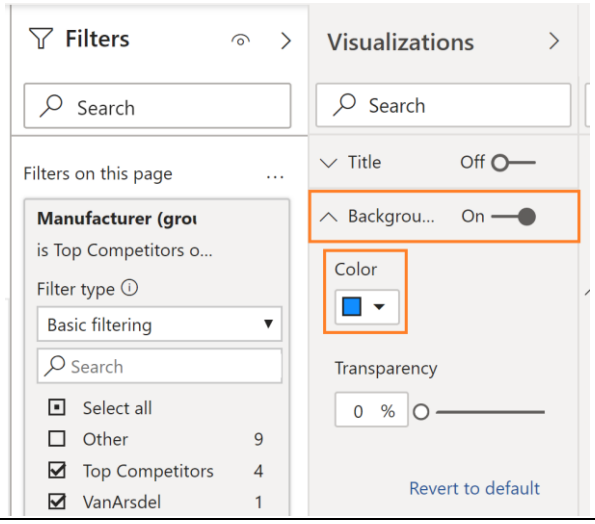
Let's check out some of the themes available. 37. From the ribbon, select **View -> Themes -> Temperature**. Notice colors on all the visuals updated. Feel free to try the other out of the box themes.	
Marketing department has provided standard color themes to be used across reports. We can use Report Theme feature in Power BI by uploading a theme. Report Theme requires a JSON file where the data colors, background, foreground and table Accent colors are defined. The JSON file can be used across all the reports. 38. From the ribbon, select **View -> Themes -> Browse for themes...**.	

39. File browser dialog opens. Navigate to **/Data/Theme** folder. 40. Select **DIADTheme2** file and select **Open**. 41. Once theme is imported, a success dialog opens. Select **Close**. Notice colors on all the visuals updated. Your report should look something like the screenshot at this point. This theme looks good. Now most of the visuals are blue in color, let's add some contrast. Note – Here you can save and add your own custom themes	
42. Select the **Gauge** visual. 43. From **VISUALIZATIONS** panel, select **paint roller** icon. 44. Expand **Data colors** section. 45. Select the drop down next to **Target**. Notice the color palette is different now. Select **black** color. Notice the change in the visual.	
46. Collapse **Data colors** section. 47. Expand **Data Labels** section. 48. Decrease **Text size** to **10**. 49. Expand **Target** section. 50. Decrease **Text size** to **10**.	

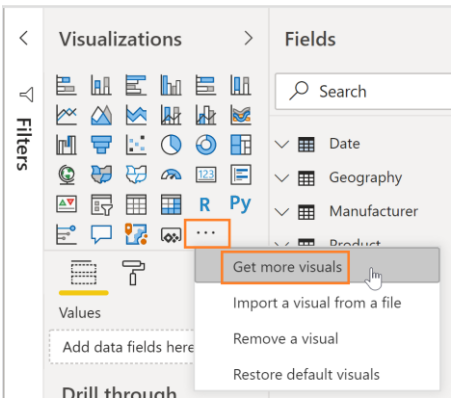
51. Select **Matrix** visual. 52. Drill up to **Segment** level. 53. Select **Revenue by Country** visual. 54. Drill up to **Country** level. 55. From **VISUALIZATIONS** panel, select **paint roller** icon. 56. Expand **Data colors** section. 57. Select a light shade of **gray** as the **Default color**. 58. Enable and expand **Data labels**. 59. Change Display units to **Millions**. 60. Notice there a lot of formatting options. E.g. visual title can be changed and formatted, you can add a border and background to the visual, etc. Feel free to explore the options.	
61. Select **Revenue and % Growth by Year** visual. 62. From **VISUALIZATIONS** panel, select **paint roller** icon. 63. Expand **Data colors** section. 64. Select **black** color for **% Growth.** Select a light shade of **gray** as the **Default Column color**.	
Let's add a report title. 65. From the ribbon, select **Home -> Text box**. Notice a text box visual is added. 66. **Resize** the visual as needed. 67. Enter **Manufacturer Analysis** in the Text box. 68. **Highlight** Manufacturer Analysis to format the text. 69. Select **Segoe (Bold)** as the **font**. 70. Select **36** as the **font size**. 71. **Resize** the text box as needed.	

72. From the **ribbon**, select **View**. 73. Select the checkbox next to **Show Gridlines** and **Snap to Grid**. This will help with aligning the visuals. 74. Uncheck **Show Gridlines** and **Snap to Grid** options to disable these features. 75. Right click on the page name in the lower left corner and click **Rename Page** 76. Rename the page to Manufacturer.	
We can also use a background image to format the reports. Let's try it. 77. Click on the **white space** in the canvas. 78. From **VISUALIZATIONS** panel, select **paint roller** icon. 79. Expand **Page Background** section. 80. Select **Add Image** button. 81. File browser dialog opens. Browse to **/DIAD/Data** folder. 82. Select **Background** file. Select **Open**.	
83. From **Image Fit** drop down, select **Fit**. 84. Slide **Transparency** slider to **0%**. Notice we have a template which has place for header and slots for images. 85. **Resize** and **arrange** the visuals as shows in the screenshot.	

	
Let's add a logo. 86. From the ribbon, select **Insert -> Image** 87. File browser dialog opens. Browse to **/DIAD/Data** folder. 88. Change file type to **All files(*)** 89. Select **VanArsdel_Logo** file. 90. Select **Open**. 91. **Resize** the visual as needed. 92. **Drag** the visual to the top left corner of the page. **Note:** The logo is transparent. You need to place it on the blue background to see it.	
Let's change the font color of report title. 93. Highlight **Manufacturer Analysis**. Select the arrow next to **A** for font color. Select **white** color. 94. Change the size of the font to **24** 95. Click on **Background** in the Visualizations pane, select the color blue shown to the right.	



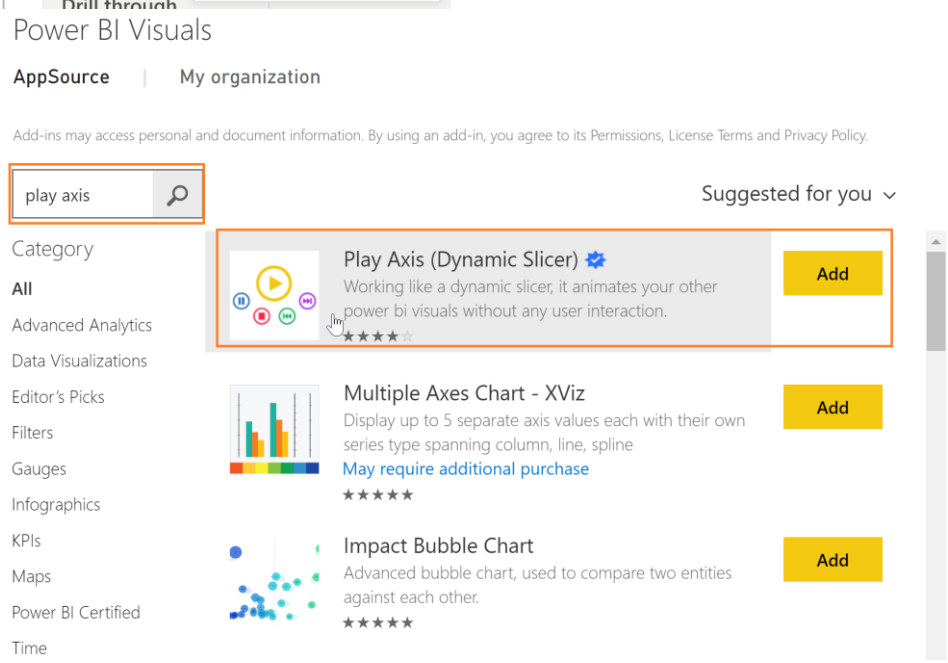
Out of the box, Power BI has a good selection of visuals. However, there is always a use-case where you need a custom visual. To meet this need, the visualization engine is open sourced. Power BI community contributes visuals which are available in the marketplace. You can add and use these visuals in your reports.

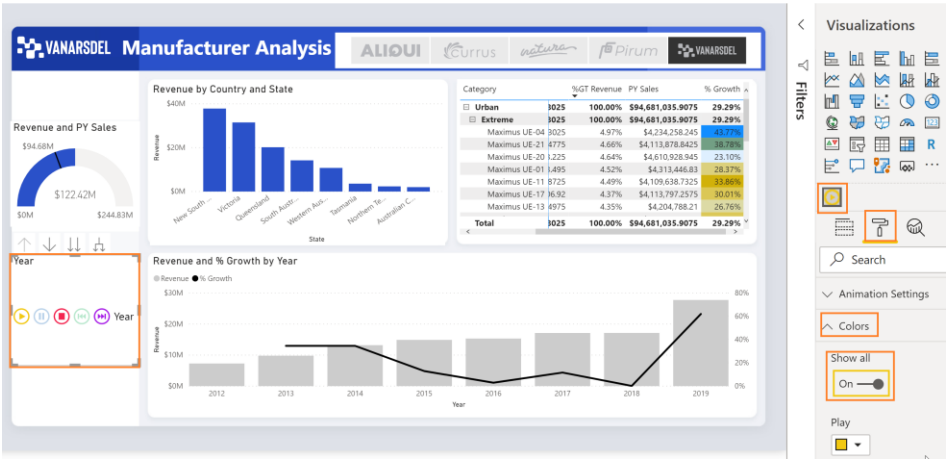
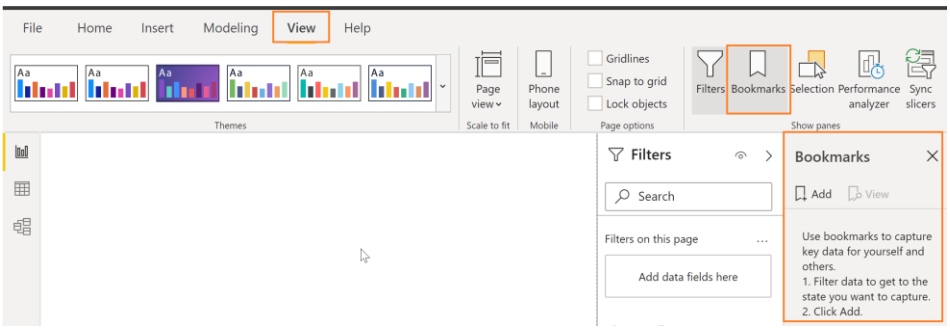
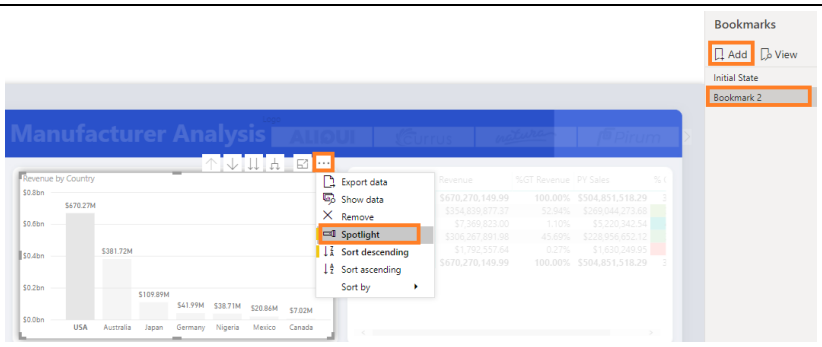


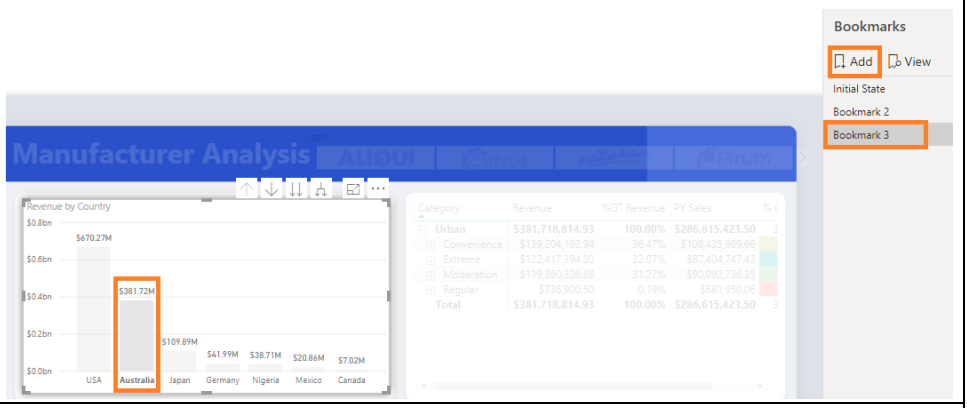
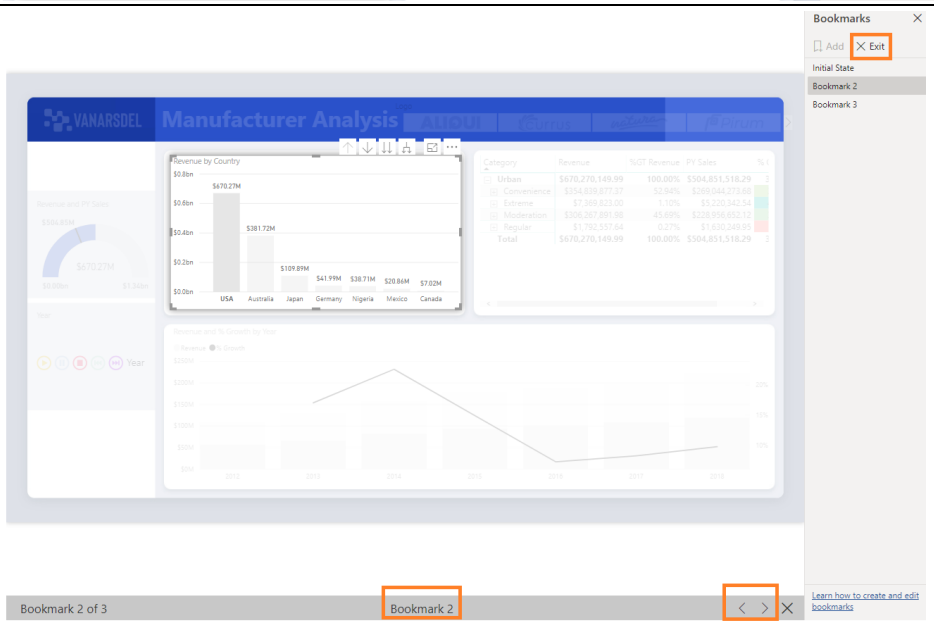
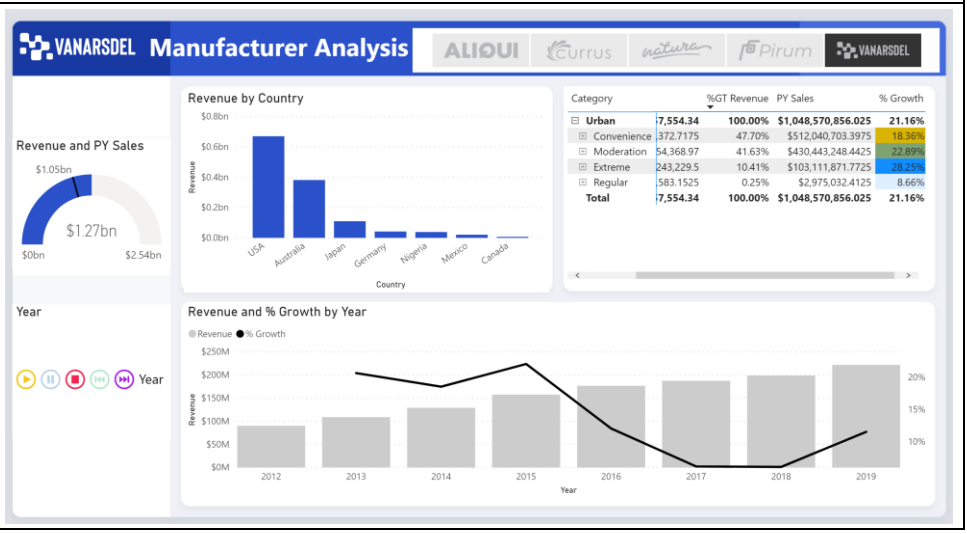
There is also an option to create your own visual and import it into Power BI Desktop.
Let's add a custom visual.

96. From **VISUALIZATIONS** section, select the ellipsis in the last row of visuals.
97. Select **Get more visuals**.
98. Type **play axis** in the **search box** and select search.
99. Select **Add** next to **Play Axis (Dynamic Slicer)**.

Note: Notice the checkmark in the blue star. This sign is used to identify certified custom visuals. Custom visuals that meet Power BI teams coding requirements are certified. Certified custom visuals support features like export to Power Point, ability to display in subscription emails which is not supported by non-certified custom visuals.



100. Import custom visual dialog opens. Select **OK**. 101. Notice a new visual is added to the list of available visuals.	
102. Click on the **white space** in the canvas. 103. From **VISUALIZATIONS** section, select the newly imported **Play Axis** visual. 104. From **FIELDS** section, click the checkbox next to **Date** field in **Date** table. 105. From **VISUALIZATIONS** panel, select **paint roller icon**. 106. Expand **Colors** section. 107. Enable **Show all** option. **Resize** and **position** the visual as shown in the screenshot.	
Now we have a report ready, let's use Bookmarks to tell the story we discovered. Bookmarks capture the currently configured view of a report page, including filtering and the state of visuals which makes it easy to present the story. 108. From the **ribbon**, select View. 109. Select the **Bookmarks button** to enable Bookmarks. BOOKMARKS pane opens. 110. Click on **Add** in **BOOKMARKS** pane. This will add the current state of the visual to the bookmark. 111. Click on the **ellipsis** next to the newly created **Bookmark 1**. Select **Rename** to rename it to **Initial State**	
112. In **Revenue by Country** visual, select **USA** column. 113. Hover over **Revenue by Country** visual and select the **ellipsis** on the top right corner. 114. Select **Spotlight**. 115. In the **BOOKMARKS** pane, select **Add**. This will add a new bookmark with the current state of the report.	

116. Click on the canvas. 117. Select **Australia** in **Revenue by Country** visual. 118. In the **BOOKMARKS** pane, select **Add**. This will add a new bookmark with the current state of the report.	
119. From the **BOOKMARKS** pane, select **View**. You are in Bookmarks slide show mode. You will be in the first bookmark which we called Initial State. Notice on the bottom of the report pane there is an option to navigate between bookmarks. 120. You can use the **arrows** to navigate between bookmarks and tell your story. 121. From **BOOKMARKS** pane, select **Exit** to exit Bookmarks slide show mode. 122. If time permits, feel free to explore other options available with Bookmarks like Selected Visuals and more as you continue to build the story.	
123. From the ribbon, select **View**. 124. **Uncheck Bookmarks Pane**. 125. **Collapse** the **Visualizations** and **Filters** pane by clicking on the arrows. **Report** should look as shown in the figure. **Save** the file. 126. Select **File -> Save**. You have built your first report!!!	

You have successfully completed the hands-on lab in creating a report to share to your team. The next section covers creating a dashboard from this report so that you can easily share it to your team. You have learned a quick overview of various functionality in Power BI Desktop to get accelerated. There are a lot more features for you to build upon this on your own data.

References

Dashboard in a Day introduces you to some of the key functionalities available in Power BI. In the ribbon of Power BI Desktop, the Help section has links to some great resources to help you as needed.

Here are a few more references that will help you with your next steps with Power BI.

Getting started: http://powerbi.com

Power BI Desktop: https://powerbi.microsoft.com/desktop

Power BI Mobile: https://powerbi.microsoft.com/mobile

Community site https://community.powerbi.com/

Power BI Getting started support page:
https://support.powerbi.com/knowledgebase/articles/430814-get-started-with-power-bi

Support site https://support.powerbi.com/

Feature requests https://ideas.powerbi.com/forums/265200-power-bi-ideas

New ideas for using Power BI https://aka.ms/PBI_Comm_Ideas

Power BI courses http://aka.ms/pbi-create-reports

OR CONCEPTS. YOUR EXPERIENCE WITH USING SUCH FEATURES AND FUNCITONALITY IN A PHYSICAL ENVIRONMENT MAY ALSO BE DIFFERENT.

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