Power BI training

Power BI

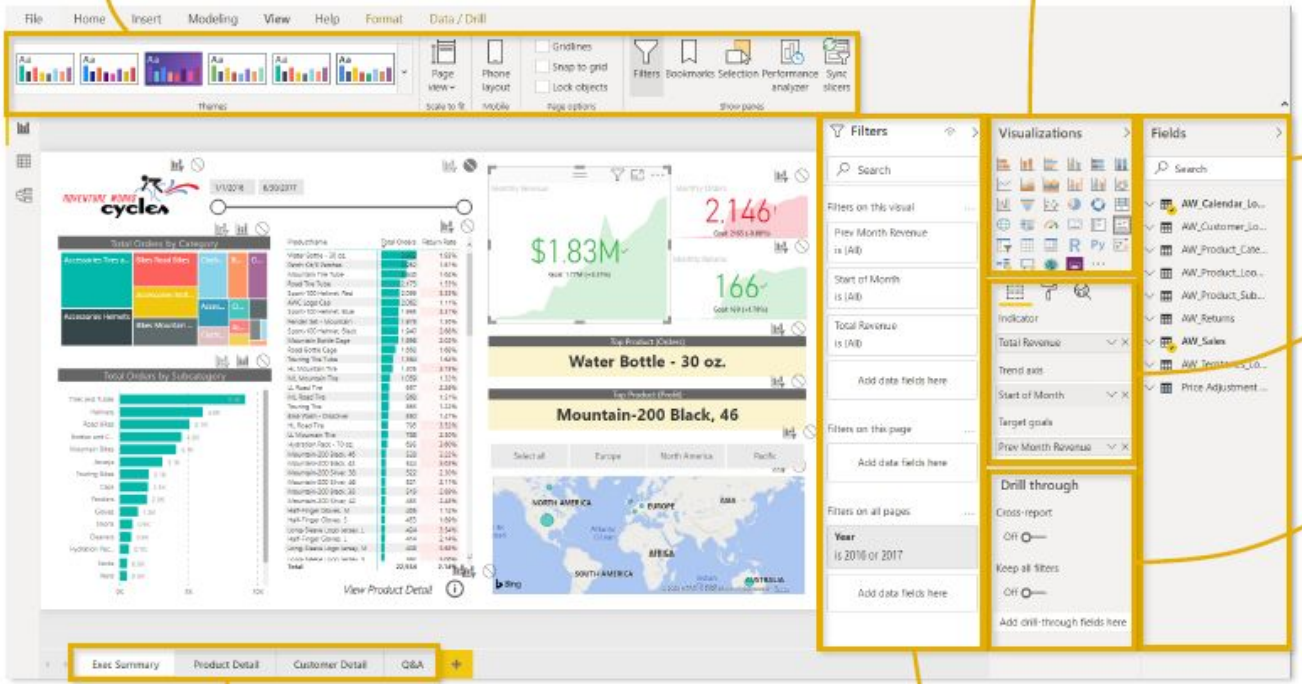
Turn your data into Impact!

Power BI

REPORTS VIEW

View Options (*Themes, Layouts, Gridlines, Filter/Bookmarks/Selection Panes, etc*)

Visualization Options (*Charts, Slicers, Maps, Matrices, etc*)



Field List (*Tables, Columns, Measures*)

Fields/Format/Analytics Pane (*Visual-specific configuration & formatting tools*)

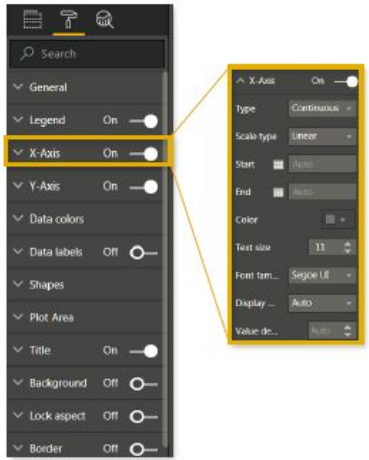
Drill through Filters (*Options for page-level drill through filters*)

Report Pages (*Similar to Excel tabs; each is a blank reporting canvas*)

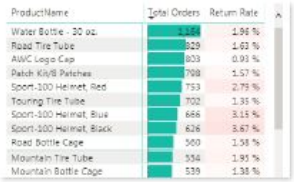
Filters Pane (*Visual-Level, Page-Level, and Report-Level Filters*)

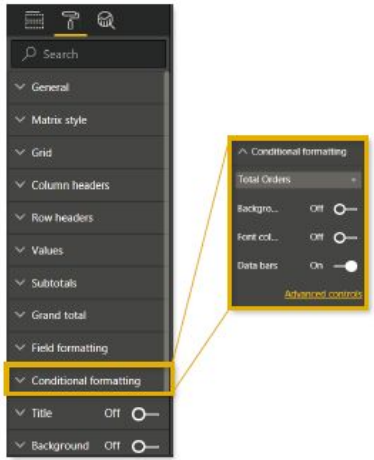
REPORTS VIEW - FORMATTING OPTIONS

Example: Line & Column Chart

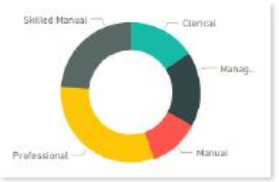


Example: Matrix





Example: Donut Chart



Note - *Formatting options will vary depending on the Chart type you select from the Build Visual pane*

EXERCISE ON REPORTS - ADDING BASIC VISUALS - BAR CHARTS

1. Create a bar chart showing the count of patients by gender. (**Hint**: Use the "PatientGender" field for the category axis and count the number of patients for each gender).
2. Generate a bar chart displaying the total expenses by payer. (**Hint**: Use the "PayerName" field for the category axis and sum the "Insurance_Payment" field for each payer).
3. Create a bar chart showing the count of patients by region. (**Hint**: Use the "Region" field for the category axis and count the number of patients in each region).
4. Generate a grouped bar chart comparing the total insurance payments and patient payments by hospital location. (**Hint**: Use the "LocationName" field for the category axis, group the bars by "Insurance_Payment" and "Patient_Payment", and calculate the sum of payments for each location.)
5. Generate a bar chart comparing the total insurance payments and patient payments by diagnosis code. (**Hint**: Use the "DiagnosisCode" field for the category axis and compare the sum of "Insurance_Payment" and "Patient_Payment" for each diagnosis code)

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ADDING BASIC VISUALS - BAR CHARTS (PRACTICE QUESTIONS)

1. Show a bar chart comparing the number of patients in each blood group. (**Hint**: Use the "BloodGroup" field on the X-axis and the count of patients on the Y-axis.)
2. Show a bar chart comparing the total insurance payments for each payer. (**Hint**: Use the "PayerName" field on the X-axis and the sum of insurance payments on the Y-axis.)
3. Create a bar chart comparing the total insurance payments for each hospital. (**Hint**: Use the "LocationName" field on the X-axis and show the sum of insurance payments on the Y-axis).
4. Show a bar chart comparing the count of patients for each day of the week.
5. Create a bar chart displaying the count of patients by exercise habits (Yes/No). (**Hint**: Use the "Exercise" field on the X-axis and show the count of patients on the Y-axis).

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ADDING BASIC VISUALS - PIE AND DOUGHNUT CHART

Pie Chart

1. What is the distribution of patients by gender in the dataset? (**Hint**: Create a pie chart showing the percentage of male and female patients).
2. How does the distribution of patients' age groups look like? (**Hint**: Group patients into age brackets (e.g., 0-10, 11-20, etc.) and create a pie chart showing the percentage of patients in each age group).

Doughnut Chart

1. What is the distribution of patients' alcohol consumption? (**Hint**: Use the "Alcohol" field to create a Doughnut Chart and visualize the percentage of patients based on their alcohol consumption habits.)

Power BI

ADDING BASIC VISUALS - PIE CHARTS (PRACTICE QUESTIONS)

1. Display a pie chart to represent the distribution of patients by blood group.(**Hint**: Use the "BloodGroup" field for the pie chart).
2. Visualize the distribution of patients across different ethnicities using a pie chart.(Hint: Use the "Ethnicity" field for the pie chart).
3. Create a pie chart to represent the distribution of patients by tobacco usage.(**Hint**: Use the "Tobacco" field to categorize patients into tobacco users and non-users).
4. Display a pie chart to represent the distribution of patients by diet type.(**Hint**: Use the "Diet" field to categorize patients into different diet types).
5. Generate a pie chart to visualize the distribution of patients by physician specialty.(**Hint**: Use the "ProviderSpecialty" field for the pie chart).

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ADDING BASIC VISUALS - DOUGHNUT CHART (PRACTICE QUESTIONS)

1. Show the proportion of patients belonging to different ethnicities using a donut chart.(**Hint**: Group the data by the Ethinicity field and visualize it using a donut chart).
2. Show the percentage of patients from different regions using a donut chart.(**Hint:** Group the data by the Region field and visualize it using a donut chart).
3. Show the proportion of patients treated by different physicians using a donut chart.(**Hint**: Group the data by the ProviderName field and visualize it using a donut chart).
4. Display the proportion of patients with different diagnosis code groups using a donut chart.(**Hint**: Group the data by the DiagnosisCodeGroup field and visualize it using a donut chart).
5. What is the distribution of patients' alcohol consumption?(**Hint**: Use the "Alcohol" field to create a Doughnut Chart and visualize the percentage of patients based on their alcohol consumption habits.)

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ADDING BASIC VISUALS - LINE CHART

1. What is the trend in gross expenses over the months? (**Hint**: Use the "Month" field on the x-axis and sum the gross expenses on the y-axis).

(Question - Which month had the highest total gross expenses?)

2. What is the trend in gross expenses over the day of the week . (**Hint**: Use the "day" field on the x-axis and sum the gross expenses on the y-axis).

Power BI

ADDING BASIC VISUALS - AREA CHART

1. Compare the "Insurance Payment" and "Patient Payment" over time using an area chart. (**Hint**: Use the "Date" field for the X-axis and create two separate series for "Insurance Payment" and "Patient Payment" on the Y-axis.)
2. Visualize the distribution of CPT code units across different months using an area chart. (**Hint**: Use the month on x-axis and CPT code units y-axis).

Power BI

LINE AND AREA CHART (PRACTICE QUESTIONS)

Practice the below question -

1. Create an area chart to visualize the trend of "Gross Expenses" over time.(**Hint**: Use the "Date" field for the X-axis and the "Gross Expenses" field for the Y-axis).
2. Compare the "Insurance Payment" and "Patient Payment" over time using an area chart.(**Hint**: Use the "Date" field for the X-axis and create two separate series for "Insurance Payment" and "Patient Payment" on the Y-axis).
3. Show the trend of "Insurance Payment" over time for a specific "Payer" using an area chart.(Hint: Use the "Date" field for the X-axis, filter the data for a specific "Payer Name", and plot the "Insurance Payment" on the Y-axis).
4. Visualize the trend of "Gross Expenses" for different "Physician Specialties" using an area chart.(Hint: Use the "Physician Specialty" field for the X-axis and aggregate the "Gross Expenses" for each specialty).

ADDING VISUALS - TABLES AND MATRIX

Power BI

1. Create a table visualization showing the patients' first name, last name, and email.(**Hint**: Drag and drop the relevant fields from the "dimpatients" table into the Values area of a table visual).
2. Create a table visualization to show the top 10 physicians with the highest gross expenses.(**Hint**: Sort the "Gross Expenses" field in descending order and limit the table to the top 10 values).
3. Create a matrix visualization to display the total insurance payment for each diagnosis code and specialty. (**Hint**: Place the "DiagnosisCodeGroup" field in the Rows area, the "ProviderSpecialty" field in the Columns area, and calculate the sum of "Insurance_Payment" in the Values area).
4. Create a matrix visualization to display the total gross expenses for each diagnosis code and physician specialty.(Hint: Place the "DiagnosisCode" field in the Rows area, the "ProviderSpecialty" field in the Columns area, and calculate the sum of "Gross Expenses" in the Values area).
5. Create a table visualization to show the patients' exercise habits (Yes/No) and the count of patients in each category.(Hint: Group the "Exercise" field and display the count of patients in each group).

Power BI

CREATING DASHBOARDS

REPORTS VIEW - CREATING DASHBOARDS

Power BI

THE SITUATION

The US Government is closely evaluating the Healthcare Industry as the pandemic started in Dec 2019. They are seeking you help and want to understand the impact of COVID on the the Healthcare industry.

THE OBJECTIVE

As an expert analyst you were given the data of the Healthcare Industry pertaining to different stakeholders for the period of 1 year. You are expected to analyse the data and present the key trends and messages to the US government so that it helps them get important insights about the impact of the pandemic using the Power BI.

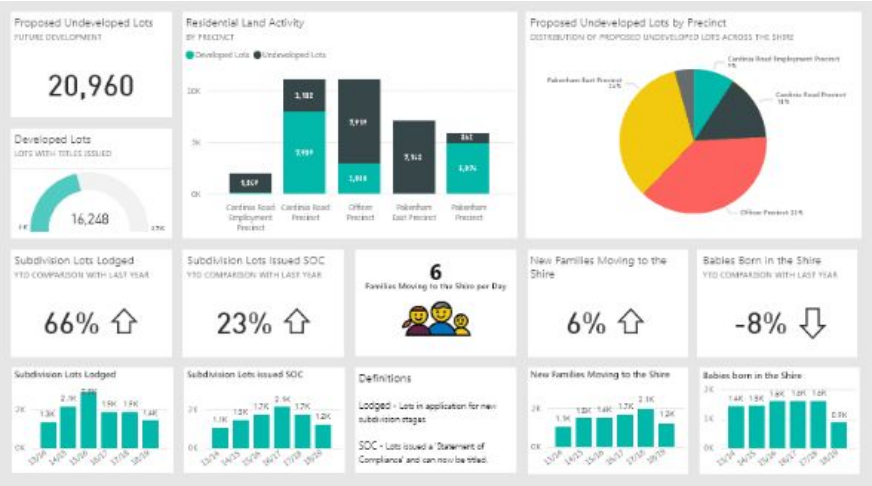
THE MESSAGE

You are required to create a comprehensive dashboard with Executive Summary presenting the KPI's. Also create separate views related to the stakeholders of the industry - Hospitals, Payers, Providers and Patients.

SOME KEY QUESTIONS WE WILL ANSWER

- How has been the trend of Healthcare expenses and patients reaching hospital over the period?
- Healthcare Industry of which Region got severely hit in terms of patient and Gross Expense?
- Which Hospital has the worst Account Receivable/ Gross Expense and InsurancePay/ TotalPay ratio?
- Which Hospital is responsible for the maximum Account Receivable and bad debts?
- Which Payer type is responsible for the maximum dispersion of medical expense?
- Which was the most dominant Hospital in terms on CPTUnits during the period of analysis.

REPORTS VIEW - CREATING DASHBOARDS

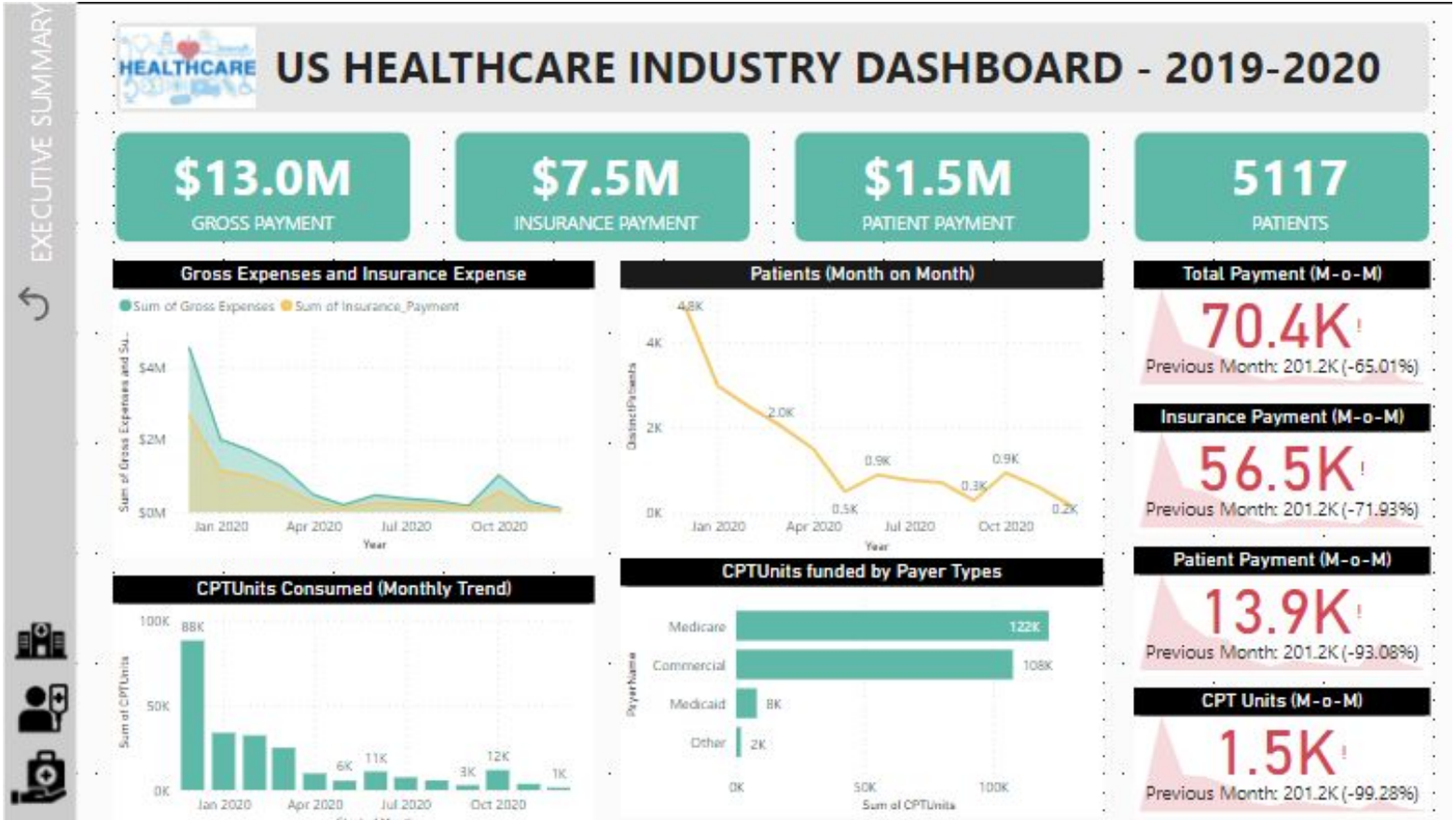


The most effective dashboards are those which target a single user or group of users and then provide the right data and visualizations accordingly.

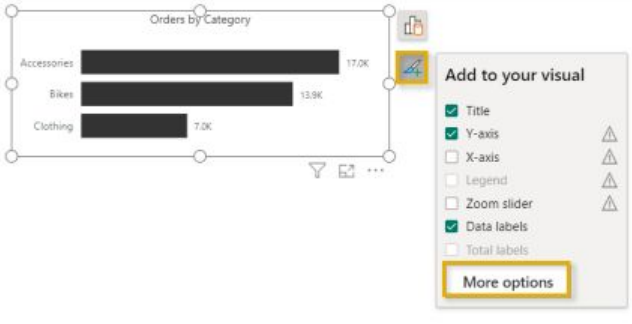
Key points in designing a dashboard

- Clearly know the Purpose
- Choose the right metrics and the charts
- Present message effectively with metrics and data
- Eliminate clutter and noise.
- Create layout that focus on attention
- Tell a interesting story

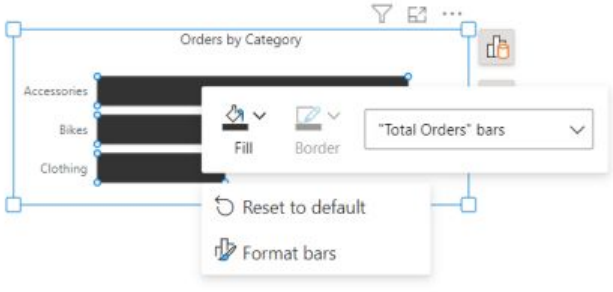
DASHBOARD VIEWS



REPORTS VIEW - FORMATTING CHARTS



The **Format menu** allows you to quickly add common chart elements (title, axis labels, data labels, legends, etc.) and access additional options and properties in the Format pane. **This is a contextual menu, so you will only see options which are relevant to the selected visual.**



On-object formatting can be enabled by double-clicking the chart object (or right-click > format), which allows you to select and edit individual chart elements. On-object formatting is only available for certain visuals (bar, column, line, area, combo & scatter).

CREATING DASHBOARD - EXECUTIVE SUMMARY VIEW (1/2)

Power BI

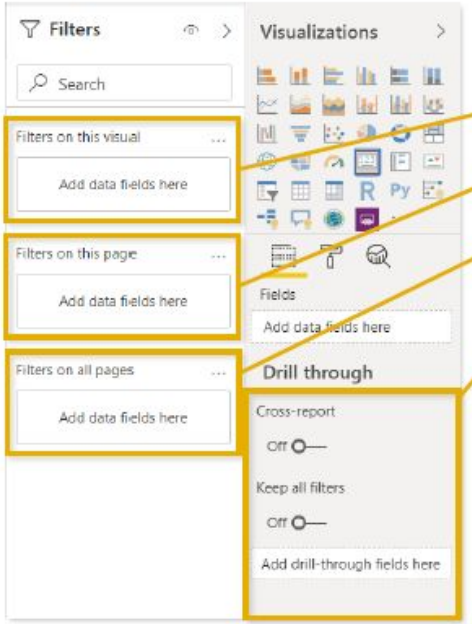
1. Right click on **White canvas > Format Canvas > Canvas Settings**. Adjust the height, width and color of the canvas as per your requirement. Add grey color for the background
2. Go to Insert and add an Image for the Healthcare Industry. Also Insert the shape for adding the title of the Dashboard. Adjust the color as required.
3. Add 4 rectangle shapes to include the KPI's and a shape on the left to add the navigation links and adjust colors. Click on Selection pane (from View menu) and group the 4 shapes.
4. Add Card template to include Gross Payment, Insurance Payment, Patient Payment and Patients into the cards. Place them over the shapes and adjust for consistent fonts
5. Insert the **area chart** template and show Gross Expense and Insurance Expense on monthly basis.
6. Insert **line chart** template and add Date on the X-axis and 'DistinctPatients' Measure on the Y-axis. Adjust the timeline to show months by years.
7. Bring the bar chart template to show the CPT Units Consumed month on month basis.
8. Create horizontal clustered bar chart to show the CPT Units by Payer Type.
9. Format the above visuals for consistent fonts, titles, data labels, colors and axis etc.
10. Add a Matrix template to show HospitalName with the CPTUnits Consumed. Check for different 'Style Presets' to choose the style of Matrix of your choice from formats.

CREATING DASHBOARD - EXECUTIVE SUMMARY VIEW (2/2)

Power BI

1. Introduce the KPI card to show the ‘Change’ in the ‘TotalPay’ on monthly basis. Add TotalPay to Value and ‘StartOftheMonth’ field to Trend Axis. Also add PreviousMonthPay to Target.
2. Create 3 more copies of the KPI card to show the ‘Change’ in the ‘InsurancePayment’, ‘PatientPayment’ and ‘CPTUnits’.
3. Place all the components as per the message you want to deliver on the Executive Summary.
4. Also bring in the Matrix template to show the CPT Units for Hospitals.

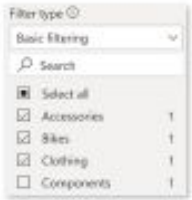
REPORTS VIEW - FILTERING OPTIONS



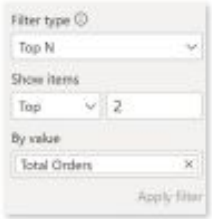
There are **four (x4)** primary filter types in Power BI reports:

1. **Visual Level:** Applies only to the ***specific visual*** in which it is defined
2. **Page Level:** Applies to ***all visuals on the specific page*** in which it is defined
3. **Report Level:** Applies to ***all visuals*** across ***all pages*** of the report
4. **Drill through:** Applies to ***specific pages***, and ***updates*** based on the item clicked

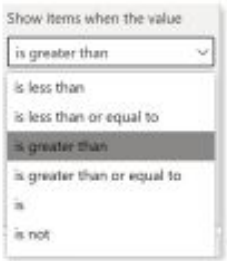
Basic Filters



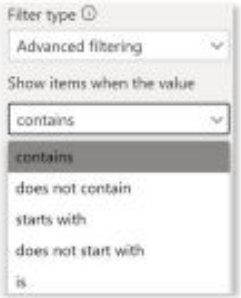
Top N Filter



Advance (Values)



Advance (Text)



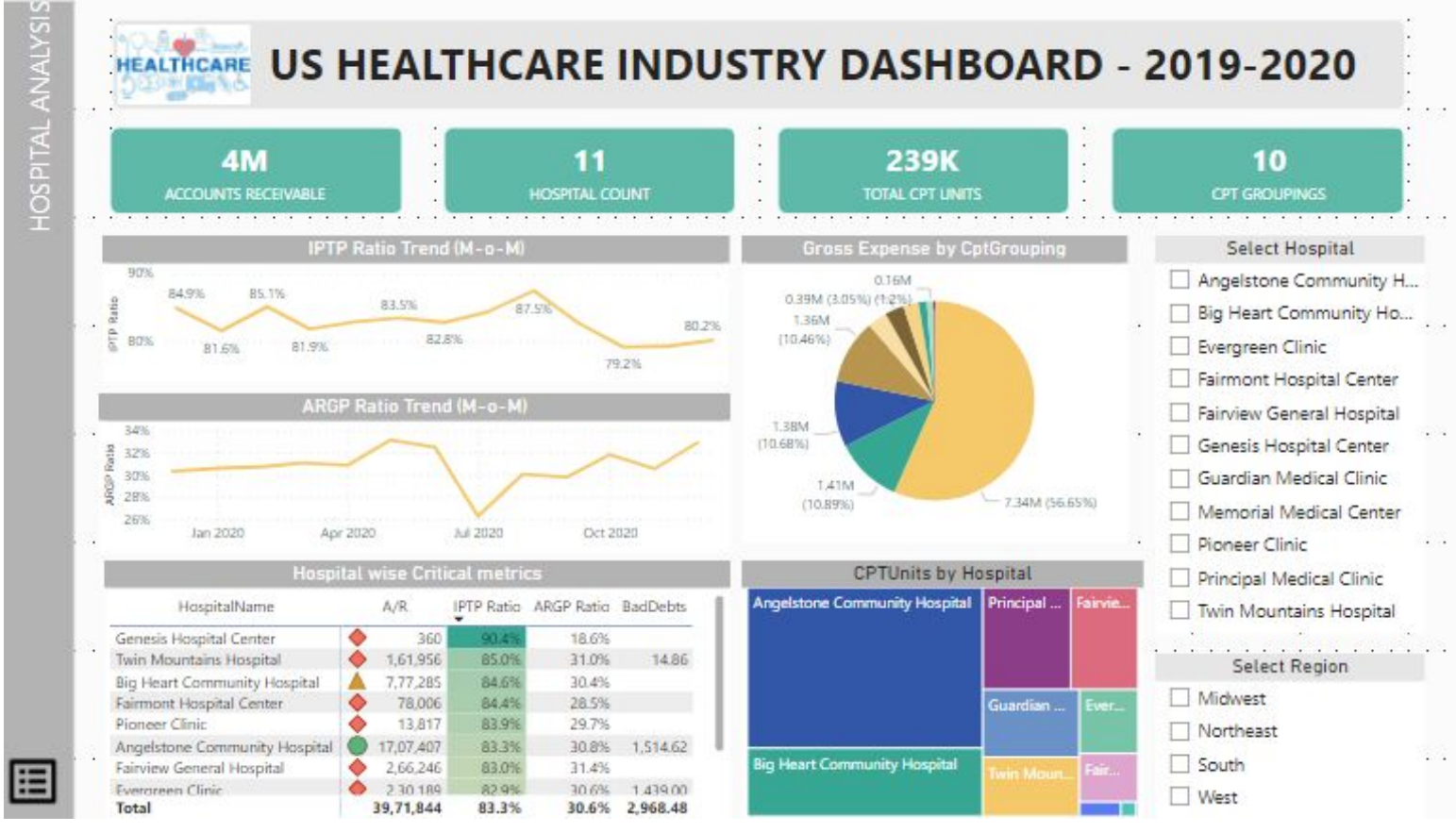
Apart from these there are 'Cross filters' which can be activated by selecting any component of a chart.

Filters can be configured using basic selections, logical operators, or Top N conditions.

EXERCISE ON FILTERS ON VISUALS - VIEW LEVEL

1. On the 'Executive Summary' View created, apply the **'cross filters'** using CPTUnits by Payer chart and CPT Units by month chart and see the impact on other visuals.
2. Also Select the 'CPTUnits by Payer' chart and explore the **'Chart level filters'** (Filters on this visuals) from the filter pane. Add another filter - Hospital Name to the visual and see the impact.
3. Now add the Region Code to **'Page level Filters'** (Filters on this page) and analyze the Executive Summary with respect to all the Regions.
4. Add Ethnicity to the 'Page level filter' (Filters on this page) and analyze the Executive Summary with respect to all the Regions.
5. Similarly Add Blood Group to the Page level filter (Filters on this page) and analyze the Executive Summary with respect to all the Regions.
6. Also analyse the 'Executive Summary' for different habits of patients - tobacco, diet, alcohol and exercise

DASHBOARD VIEW - HOSPITAL ANALYSIS



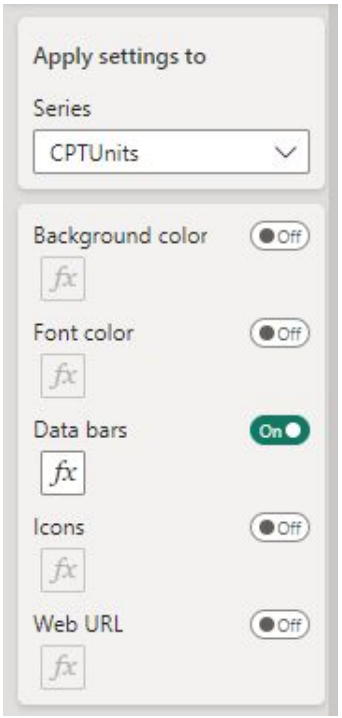
STAKEHOLDER'S VIEW - 1. HOSPITAL ANALYSIS

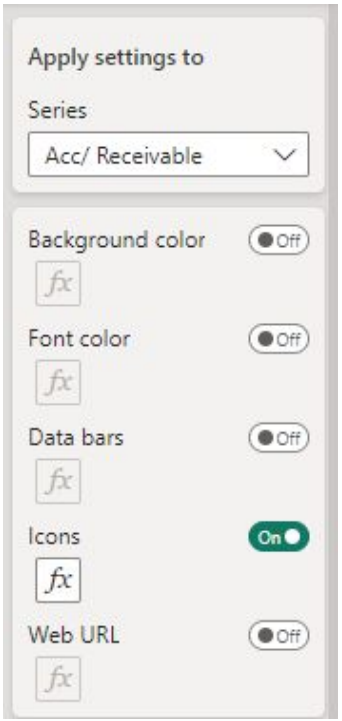
1. Duplicate the Executive Summary Page and delete the existing visuals. You can leave the top KPI's space and the navigation bar on the extreme left
2. On the KPI card include Accounts Receivable, Count of Hospitals, Total Procedures and Count of CPT Grouping
3. Create a line chart to show the ARGP Ratio (%) on monthly basis. Also create a line chart to show the IPTP Ratio (%) over the period on monthly basis. Add trend line using the formatting option.
4. Create a pie chart to show the Gross Expense by CPT Grouping.
5. Also add a Tree map to show the share of procedures (CPT Units) by Hospital during the period.
6. Also create a Matrix to include Hospital critical metrics - A/R, IPTP Ratio (%), ARGP Ratio (%) and Bad debts.
7. Add conditional formatting using Cell Elements section in Format -
    a. Add Icons to A/R
    b. Background color to IPTP Ratio (%) and ARGP Ratio (%) - Create a Rule (<50,50-80,>80) to use custom colors
8. Add slicer template to the view and add Hospital names to the filter
9. Similarly add the Region and Date to a new slicers and see the impact

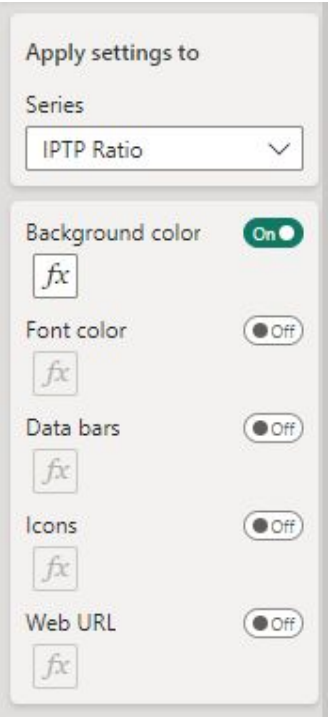
CONDITIONAL FORMATTING (FOR TABLES AND MATRIX)

HospitalName	CPTUnits	Acc/ Receivable	IPTP Ratio	ARGP Ratio
Angelstone Community Hospital	1,01,579	17,07,407	0.83	0.31
Big Heart Community Hospital	42,833	7,77,285	0.85	0.30
Evergreen Clinic	9,997	2,30,189	0.83	0.31
Fairmont Hospital Center	7,626	78,006	0.84	0.29
Fairview General Hospital	18,373	2,66,246	0.83	0.31
Genesis Hospital Center	64	360	0.90	0.19
Guardian Medical Clinic	17,557	3,47,577	0.82	0.31
Memorial Medical Center	557	23,189	0.80	0.28
Pioneer Clinic	1,525	13,817	0.84	0.30
Principal Medical Clinic	24,082	3,65,813	0.82	0.30
Twin Mountains Hospital	15,272	1,61,956	0.85	0.31
Total	**2,39,465**	**39,71,844**	**0.83**	**0.31**

- Conditional formatting applies on Tables and Matrix and allows you to dynamically format them based on cell values.
- You can apply it through Format pane under Cell Elements
- It include background color, font color, data bars, icons, or Web URL

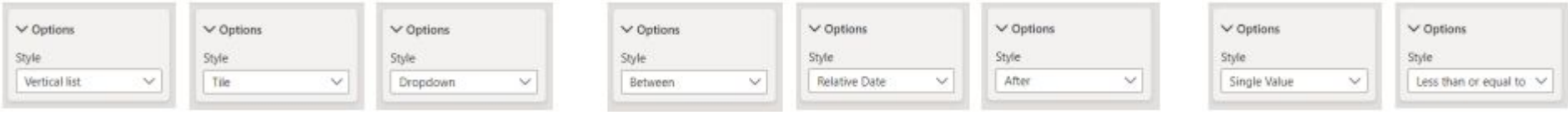




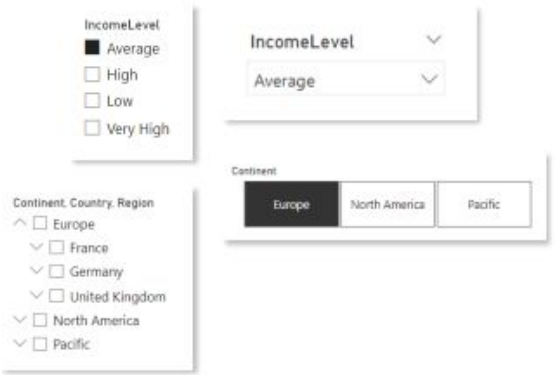


SLICERS

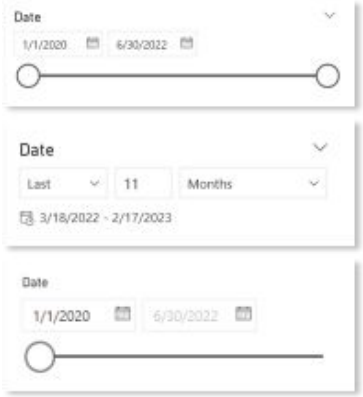
Slicers are **on screen filters** which can be **seen on the page** and **used by the user** of the dashboard to slice and dice the data. **By default they apply on all the visuals on a page.** They can take different format depending on the data type - including **list, dropdown, tiles** and **ranges.**



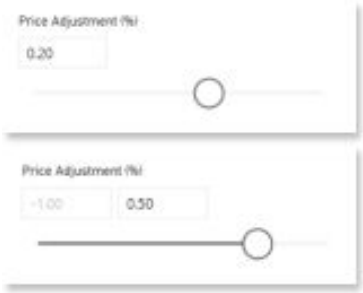
***Categorical/ Text** Slicers*



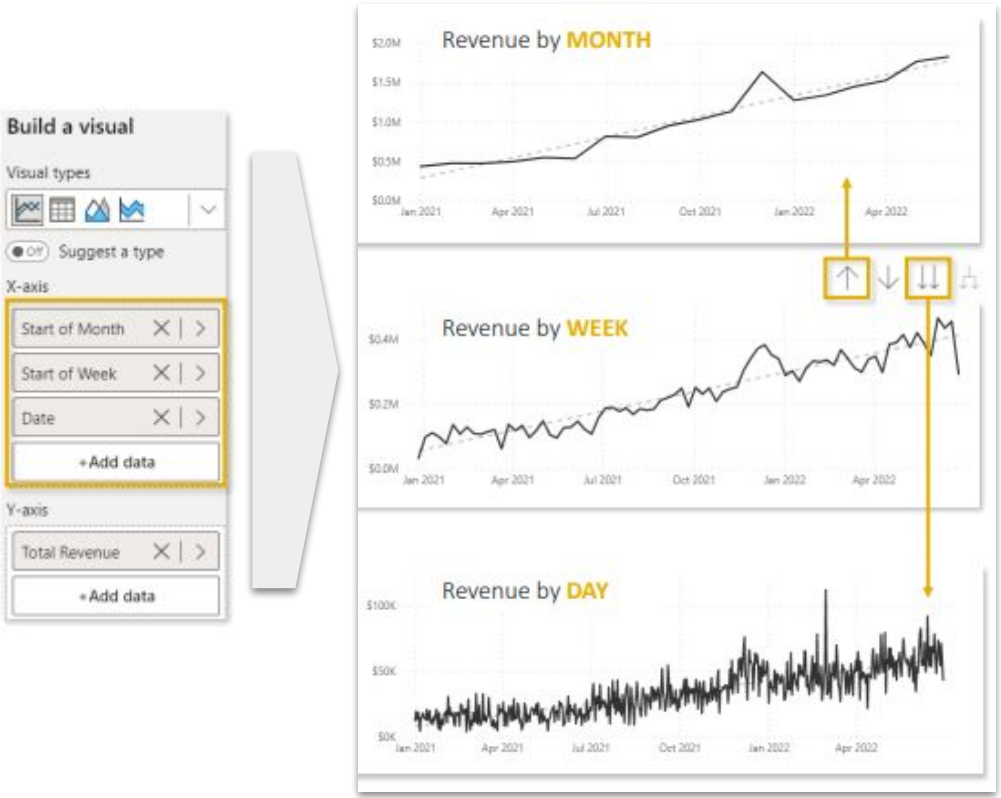
***Date/ Time** Slicers*



***Numeric** Slicers*



DRILL DOWN OPTION



Drill Up and Drill Down tools allow you to switch between different levels of granularity.

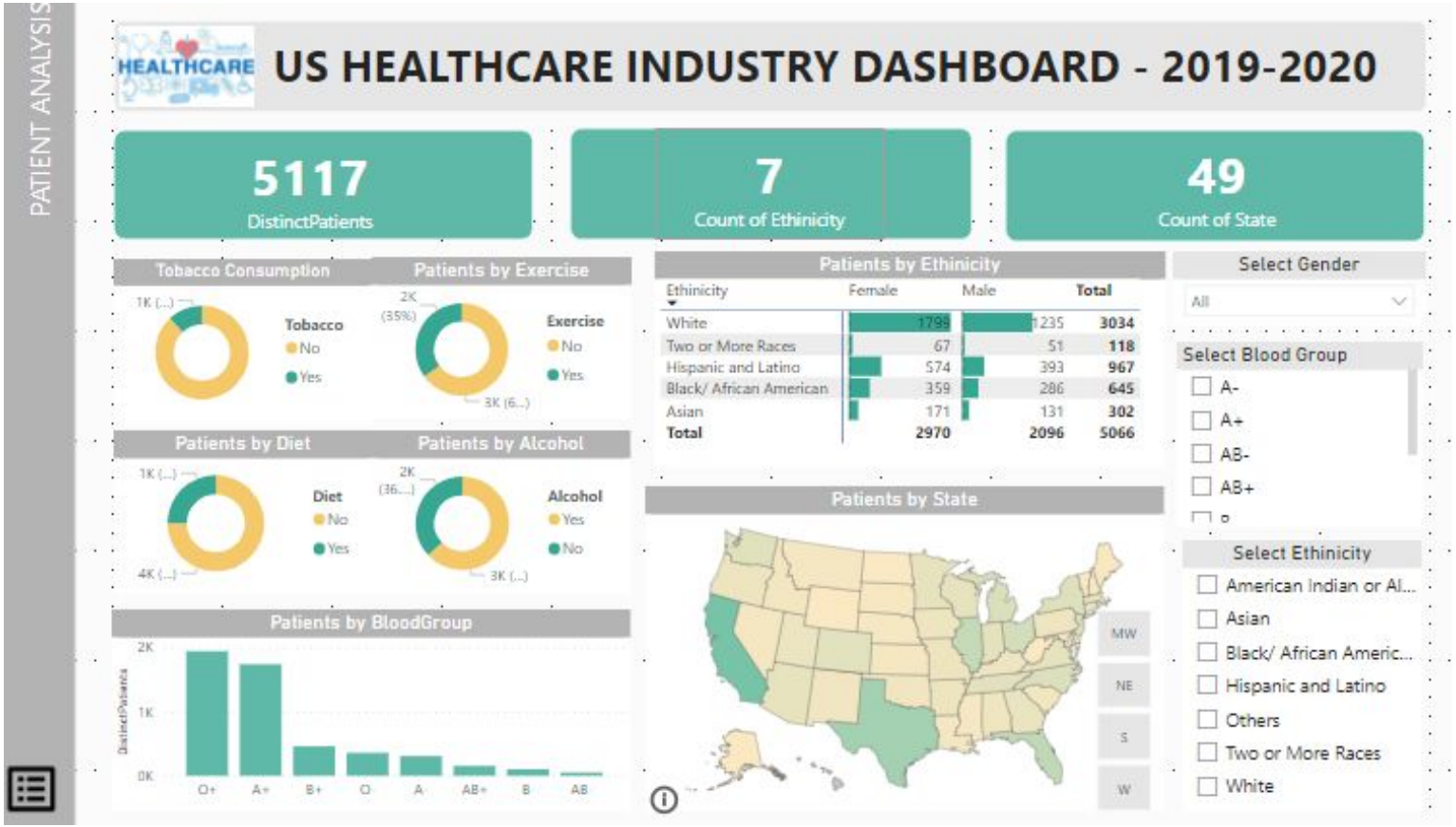
In this picture we can “drill up” from weekly to monthly, or “drill down” to daily.

The single down arrow activates drill mode, allowing users to drill by clicking data point and also filter the view.

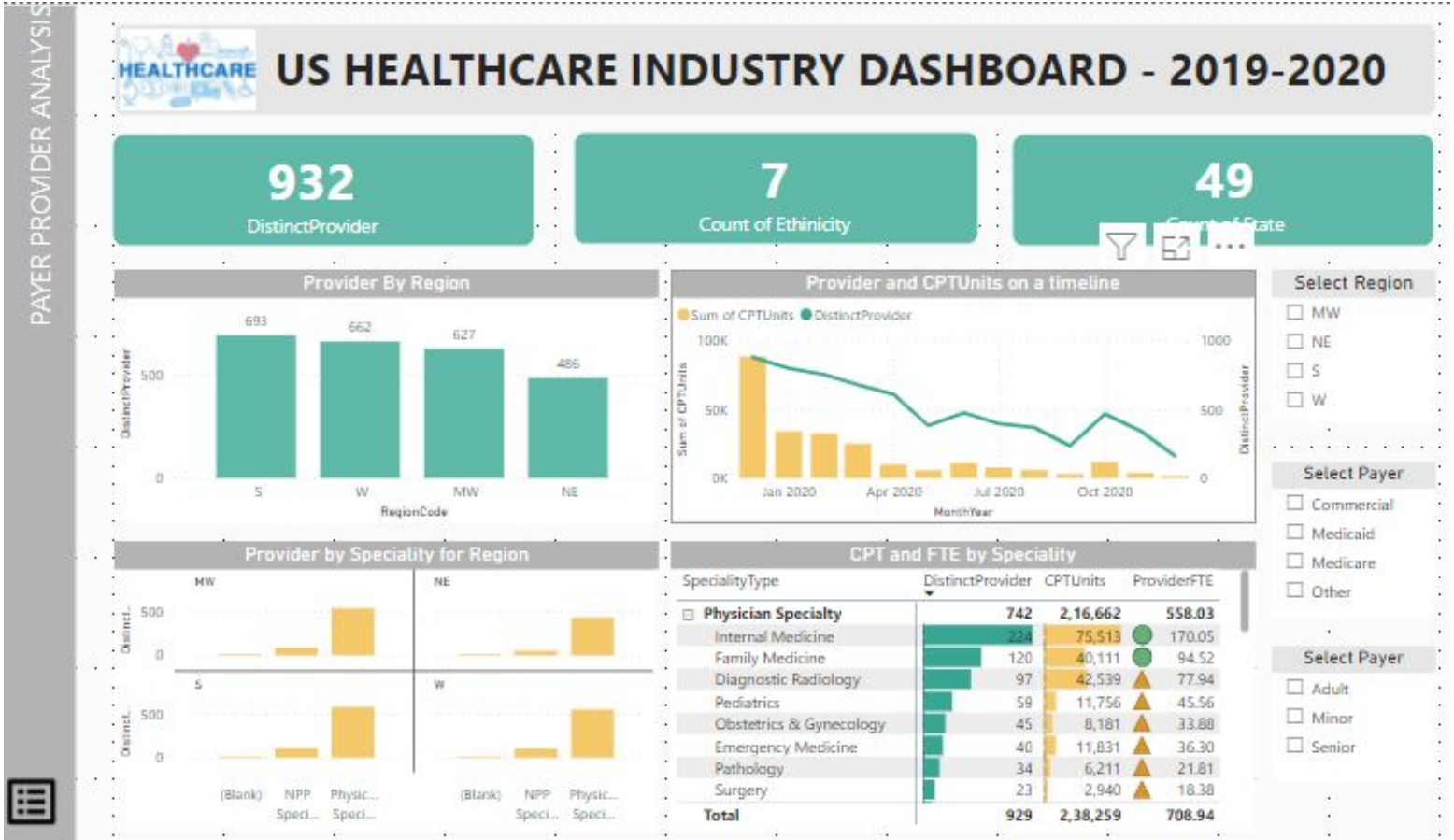
The forked down arrow expands each level of the hierarchy (used in matrix visuals)

The forked down arrow expands each level of the hierarchy (used in matrix visuals)

DASHBOARD VIEWS - PATIENT ANALYSIS



DASHBOARD VIEWS - PAYER PROVIDER ANALYSIS



STAKEHOLDER'S VIEW - 2. PATIENT AND PAYER PROVIDER ANALYSIS

- Create the Patient Analysis view and the Payer Provider Analysis View looking at the Views given in the previous slides.
- Include the Conditional Formatting and the slicers
- In the Patient Analysis also add the Name of the Top Patient with the maximum Patient_Payment to the view and Top patient with the maximum CPT Units.

ADDING BOOKMARKS TO DASHBOARD - CLEARING FILTERS

Power BI

Bookmarks capture the current state of a page, and allow users to return to that state using report actions. Bookmarks are used for **clearing filters,** highlighting specific **information or insights**, **navigating reports,** etc.

Exercise - 1 (clearing all Filters)

- Goto View and open the Bookmark pane. Click on Add and rename the bookmark as ‘Clear Filter’.
- On the Insert Menu goto Button and select ‘Reset’ button.
- Place the Reset button on the navigation bar.
- On the Format pane (of the Reset button) > Select Action as Bookmark and Bookmark as Clear Filter.
- For formatting the button, now go to Button Style in the Format pane. Apply settings > On Hover. Go to Icon > Select line color to Blue.
- Apply some filters on the Executive Page. Now do a ‘Control + Click’ on the Reset icon to remove these filters.

ADDING BOOKMARKS TO DASHBOARD - INFORMATION

Exercise - 2 (Highlighting specific insights - apply to Patient Analysis View after creating it)

- In the Patient Analysis view, select the filter Asian and click on A+ blood group bar in the bar chart
- Go to Bookmark Pane and create a new Bookmark - name it as ‘Asian A+ patients’.
- On the Insert Menu goto Button and select ‘Information’ button.
- For formatting the button, now go to Button Style in the Format pane. Apply settings > On Hover. Go to Icon > Select line color to Blue.
- Add ‘Asian A+ Blood Group View’ to Text.
- Now place the information Icon to a comfortable place in the Patient View.

ADDING BOOKMARKS TO DASHBOARD - NAVIGATION

Exercise - 3 (Add navigation buttons for different views in the Executive View)

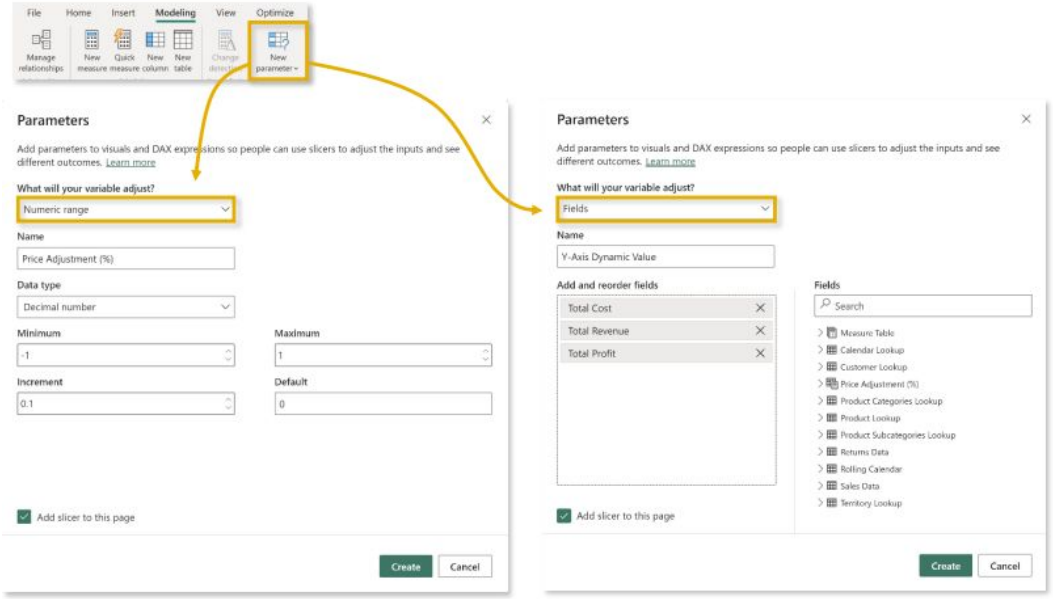
- Go to Insert Menu and add a Blank button. Follow Insert Menu > Button > Blank. Create 3 blank buttons.
- Go to format and activate action. Select Type > Page Navigation.
- For the 1st Icon, select destination as Hospital Analysis. For the other 2 icons select Patient Analysis and Provider Analysis respectively.
- Now go to Button Style > Icon > Icon Type > Custom. Then add the icon that you want to use for Hospital Analysis. Similarly use the icons for Patient Analysis and Provider Analysis respectively.
- Place the 3 icons on the navigation bar on the Executive Summary.
- Create another navigation in the same way to come back to the Executive Summary Page. Place the icon on the Hospital Analysis, Patient Analysis and Provider Analysis.

PARAMETERS

Parameters allow you to create variables which can be referenced in measures and that can be controlled via slicer. They add interactivity and makes the reports more dynamic. They can be of 2 types -

Numeric range parameters - Primarily used for scenario testing, where users adjust numerical inputs to see the impact on a given output.

Field parameters - Primarily used to allow users to dynamically change the metrics or dimensions displayed in a reports view.



CREATING NUMERIC PARAMETERS

When you create a numeric parameter, Power BI generates two new measures - One to define the parameter and another to capture the selected value:

```
Parameter = GENERATESERIES(-1, 1, 0.1)
```

```
Parameter Value = SELECTEDVALUE(Parameter[Parameter], 0)
```

Exercise

1. Goto Modelling Tab > Create Parameter > Numeric Range
2. Open a new page and create a new chart showing the monthly trend for Gross Expenses.
3. Name it as Adjustment Factor (%). Select Data Type as Decimal, Min Value = -1, Max Value = 1, Increment = 0.1 and Default = 0. Click Create.
4. Check a new Table **'Adjustment Factor (%)'** will be created.
5. Format the Parameter as per your requirement
6. Now create a new Measure as -
   AdjustedGrossExp = [TotalGrossExpense]*(1+'Adjustment Factor (%)'[Adjustment Factor (%) Value])
7. On the above chart add the AdjustedGrossExp along with the TotalGrossExpense in the Y-Axis.
8. Now use the Parameter to see the AdjustedGrossExp change with the change in the Paramter.