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Create visuals in Power BI

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In this train we will be using **Power BI to create visuals** using the Indian Premier League, IPL, dashboard available for download alongside this Train. The dashboard contains information about the matches and deliveries in the IPL.

In this train you will learn how to :

- Create visuals such as a filter, card, treemap, line, bar, scatter and column charts.
- Create a basic dashboard that is visually appealing and interactive.

Power BI

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Outline

In this train we will explore why we use visuals, the various types of visuals, and how to create them.

Why Visuals

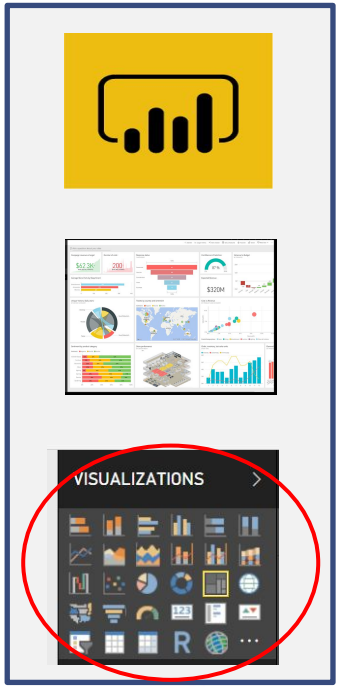
Projecting data visually increases understanding and interest by narrating through a story of data using pictures. Visuals are often integrated in projects to engage and capture the attention of an audience.

Types of Visuals

- Filter
- Table
- Card
- Line Chart
- Column Chart
- Bar Chart
- Scatter Chart
- Treemap

How to Create PowerBI Visuals

To create a visual in Power BI you simply click on a icon in the Visualizations grid on the top right of the page.

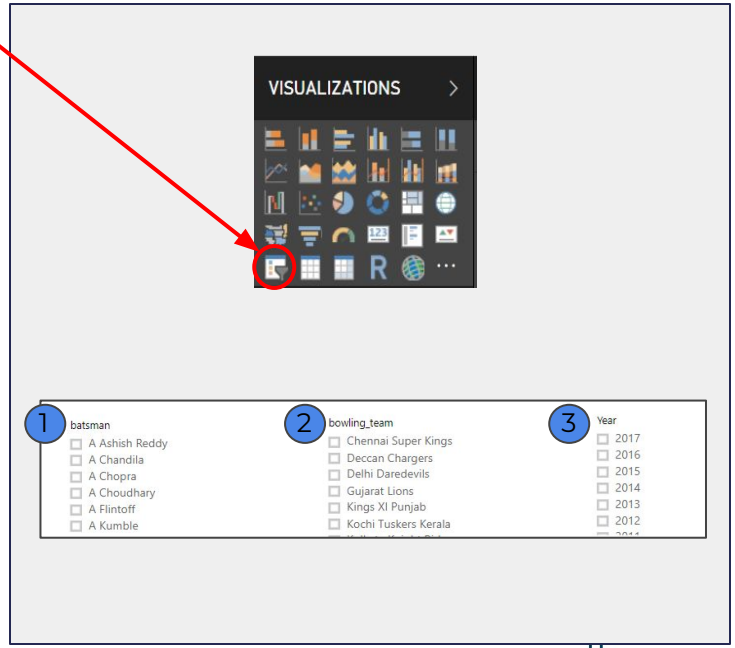


Visuals - Filter

First off, let's see how we can create a **Filter** visual.

- The **filter** is not really a visual in itself, but rather a way to show only data of interest.
- Filters can be applied to every dashboard and can be used to filter date, category or numeric data.
- A filter is created by selecting the highlighted checkbox in the visualisation menu as shown below.

Let's create filters for data extracted from the IPL.
We can create a filter for **Batsman, Bowling Team** (to analyse against opposition teams) and **Year** (to analyse over time):



1. **Batsman filter:**
   Field: deliveries[batsman]

2. **Bowling Team filter:**
   Field: deliveries[bowling_team]

3. **Year filter:**
   Field: matches[date] - *select date hierarchy (only year)*

Visuals - Table

Next up we will create the **Table** visual.

- A **table** is a grid that contains related data in a logical series of rows and columns.
- Tables are used to compare multiple exact values for a category.
- A table is created by selecting the visualisation as shown below.

Let's create a table for **batsmen**, including their runs, strike rate and average - as this will be useful to analyse metrics between batsmen:

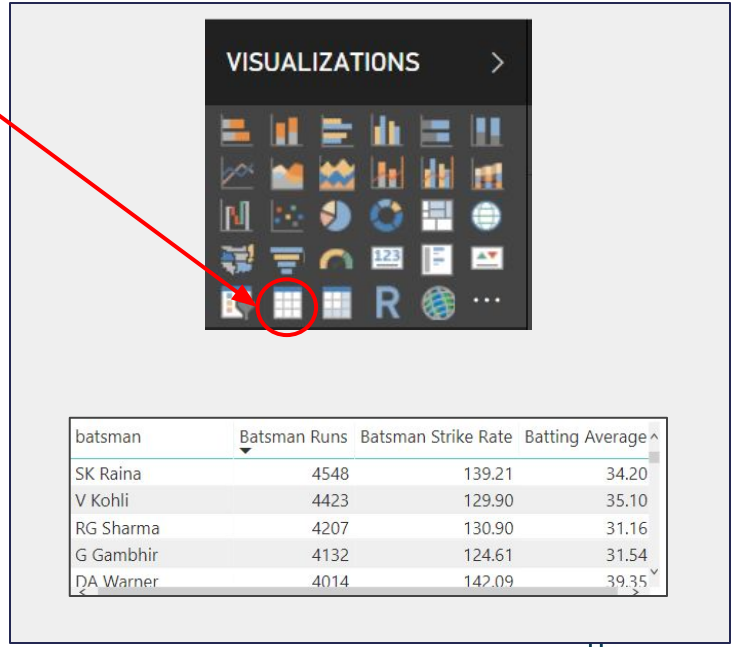


Table:

Values:

- deliveries[batsman]
- deliveries[Batsman Runs]
- deliveries[Batsman Strike Rate]
- deliveries[Batsman Average]

batsman	Batsman Runs	Batsman Strike Rate	Batting Average
SK Raina	4548	139.21	34.20
V Kohli	4423	129.90	35.10
RG Sharma	4207	130.90	31.16
G Gambhir	4132	124.61	31.54
DA Warner	4014	142.09	39.35

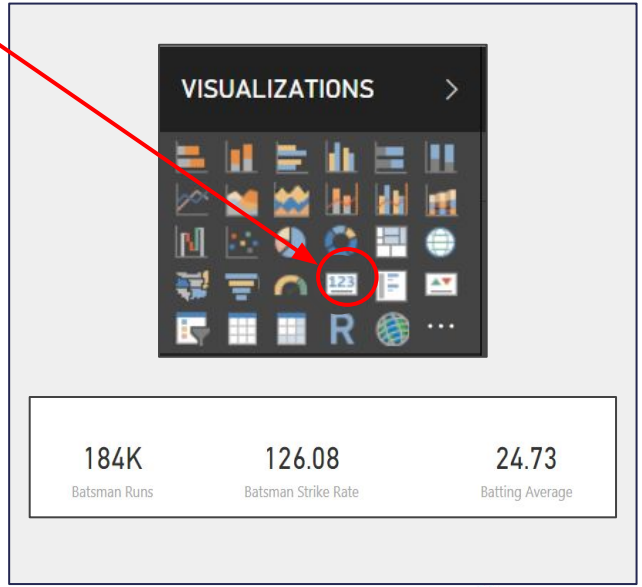
The table (sorted by runs from most to least) should look like the picture on the right (no filter applied).

Visuals - Card

Next we will create the **Card** visual.

- A **card** is a single number that is displayed.
- Cards can be used to depict the most important single number metric such as median, mode and mean in our data
- Cards can display numeric and string data types and can also be used to display data in a group format
- A card is created by selecting the visualization as shown in the image below.

Let's create cards for **Sum of Runs, Batsman Strike Rate** and **Batting Average**:



Batsman Runs card:
Field: deliveries[Batsman Runs]

Batsman Strike Rate card:
Field: deliveries[Batsman Strike Rate]

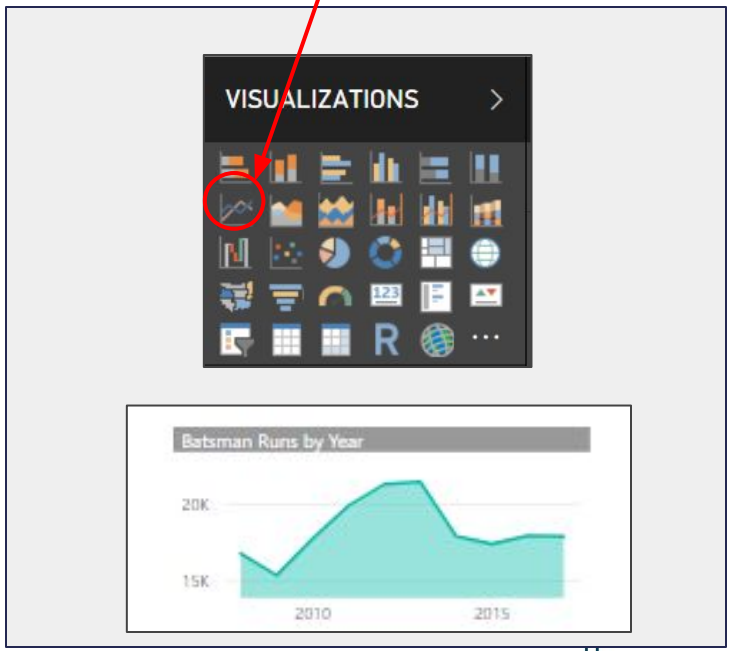
Batsman Average card:
Field: deliveries[Batting Average]

Visuals - Line Chart

Here we will create the **Line Chart** visual.

- **Line charts** are optimal for displaying data over time, or any other **sequential data**.
- A line chart can be created by selecting the visualisation as shown in the image below.

Let's create a line chart for batsman runs by year, to visualise performance over time.



Line Chart:

x-axis: matches[date] - *date hierarchy (only year)*
y-axis: deliveries[Batsman Runs]

The chart (without filters) should like the picture on the right.

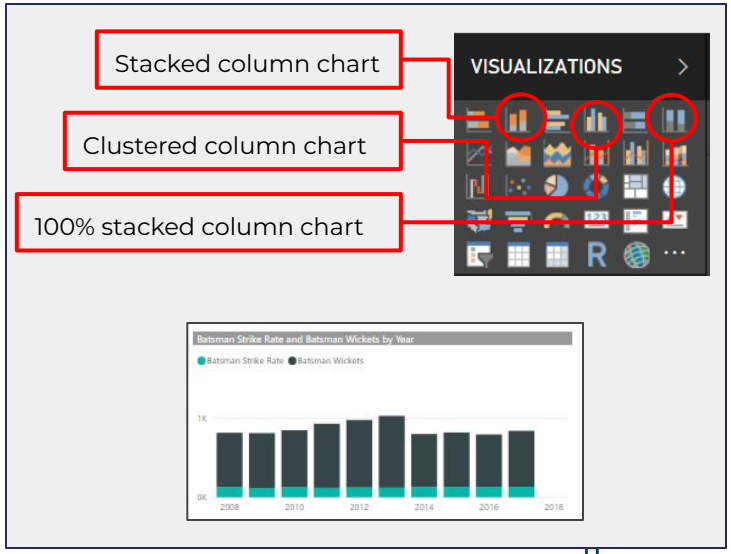
Area charts represents the change in one or more quantities over time.

Visuals - Column Chart

Next we will create the **Column chart** visual.

- Column charts display values in the form of vertical bars.
- They are used to compare values by categories or sequential data.
- Ideally used for a smaller number of categories with shorter text labels on the x-axis.
- You can create three different column chart visuals by selecting the appropriate graph you want to visualise, in the visualisation menu as seen on the right.

Let's create a column chart for batsman strike by year, to visualise performance over time.



Column Chart (stacked):

Axis: matches[date] - *date hierarchy (only year)*
Values: deliveries[Batsman Strike Rate],
deliveries[Batsman Wickets]

The chart (without filters) should look like the picture on the right.

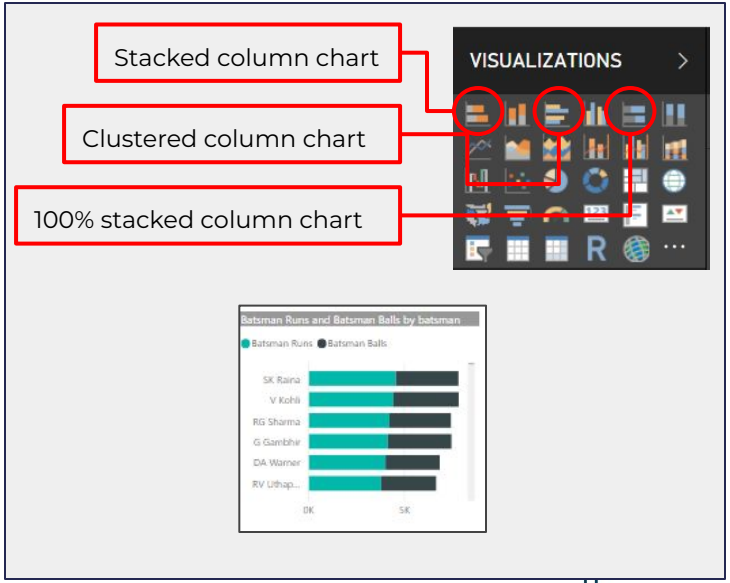
Column charts are useful for comparative analysis of more than one metric per category on the same axis, however the scales are required to be the same in order for the chart to be accurately assessed.

Visuals - Bar Chart

Here we will create the **Bar Chart** visual.

- **Bar charts** display values in the form of horizontal bars and are used to compare values by **categories**.
- They are useful for a larger number of categories with longer text labels on the y-axis.
- You can create three different bar chart visuals by selecting the appropriate graph you want to visualise in the visualisation menu as seen on the right.

Let's create a bar chart for runs by batsman sorted from highest to lowest (by clicking on the three dots above the visual and selecting sort by descending) to visualise performance between batsmen.



Bar Chart (stacked):
Axis: deliveries[batsman]
Values: deliveries[Batsman Runs]

The chart (without filters) should look like the picture on the right.

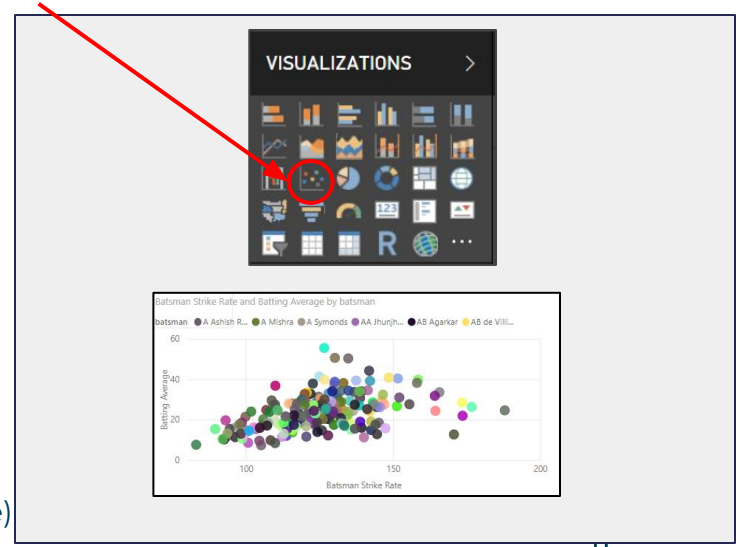
Bar charts are useful for comparative analysis of more than one metric per category on the same axis, however the scales are required to be the same to ensure accurate assessment of the bar chart.

Visuals - Scatter Chart

Here we will create the **Scatter Chart** visual.

- A **scatter chart** always has two value axes to show one set of numerical data along a horizontal axis and another set along a vertical axis.
- The chart displays points at the **intersection** of an x and y numerical value, combining these values into single data points.
- A scatter chart can be created by selecting the visualization shown in the picture below.

Let's create a scatter chart for batting average vs batsman strike rate, to visualise performance for this combination by batsman.



Scatter Chart:
Legend: deliveries[batsman]
X Axis: deliveries[Batsman Strike Rate]
Y Axis: deliveries[Batsman Average]
The chart can be filtered for Batsman Runs greater than 100.

This can be done by selecting the filter tab and below Batsman Runs → select "is greater than" then enter "100". The graph should look like the picture on the right.
Bubble charts are scatter charts where the size of the data point (bubble) is determined by another value (e.g. Batsman Runs).

Visuals - Treemap

Here we will create the **Treemap** visual.

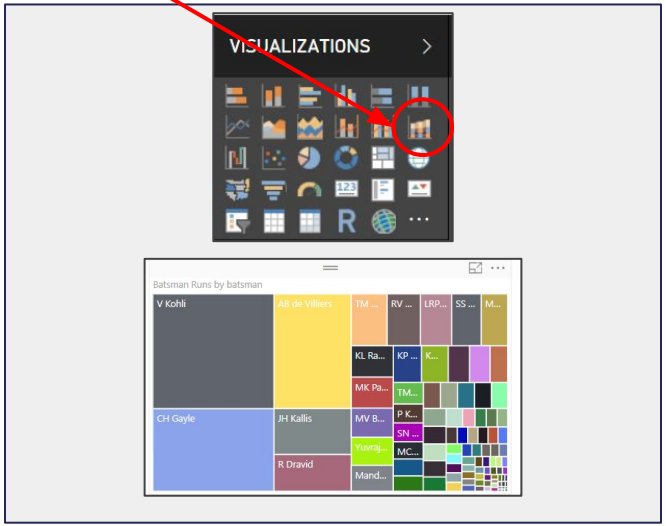
- **Treemaps** display data as a set of rectangles.
- The size of each rectangle is allocated based on the quantitative value being measured, with the rectangles arranged in size from biggest (top left) to smallest (bottom right).
- They are mainly used for representing hierarchical data in a tree-like structure.
- A treemap can be created by selecting the visualization as shown in the picture below.

Let's create a treemap for runs by batsman in the Royal Challengers Bangalore, RCB, team.

Treemap:
Details: deliveries[batsman]
Values: deliveries[Batsman Runs]

You can add a filter to the chart where batting_team is RCB. and your visual should look like the picture on the right.

A treemap can also be used to display hierarchical data, by using nested rectangles.



Interactive Dashboard – IPL demo

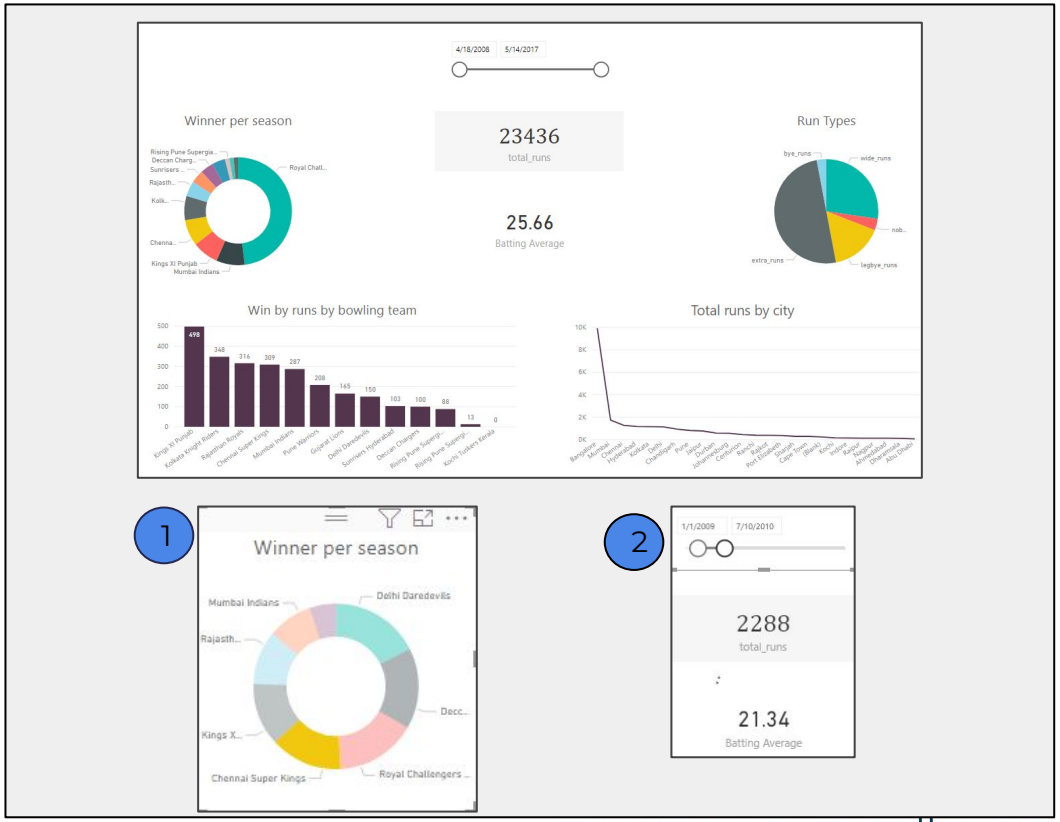
Here we look at the 1st page of our IPL demo dashboard.

Clicking on any of the bars in the bar chart will filter the entire page according to the chosen bar.

1. For instance, the selection of *Chennai Super Kings* will only show their info on the page.

2. You can then proceed to move the slider to select the time period that you would like to extract information from.

To move to page 2 select the '***Toss Choice & Win Types***' tab at the bottom of the page.



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Interactive Dashboard – IPL demo

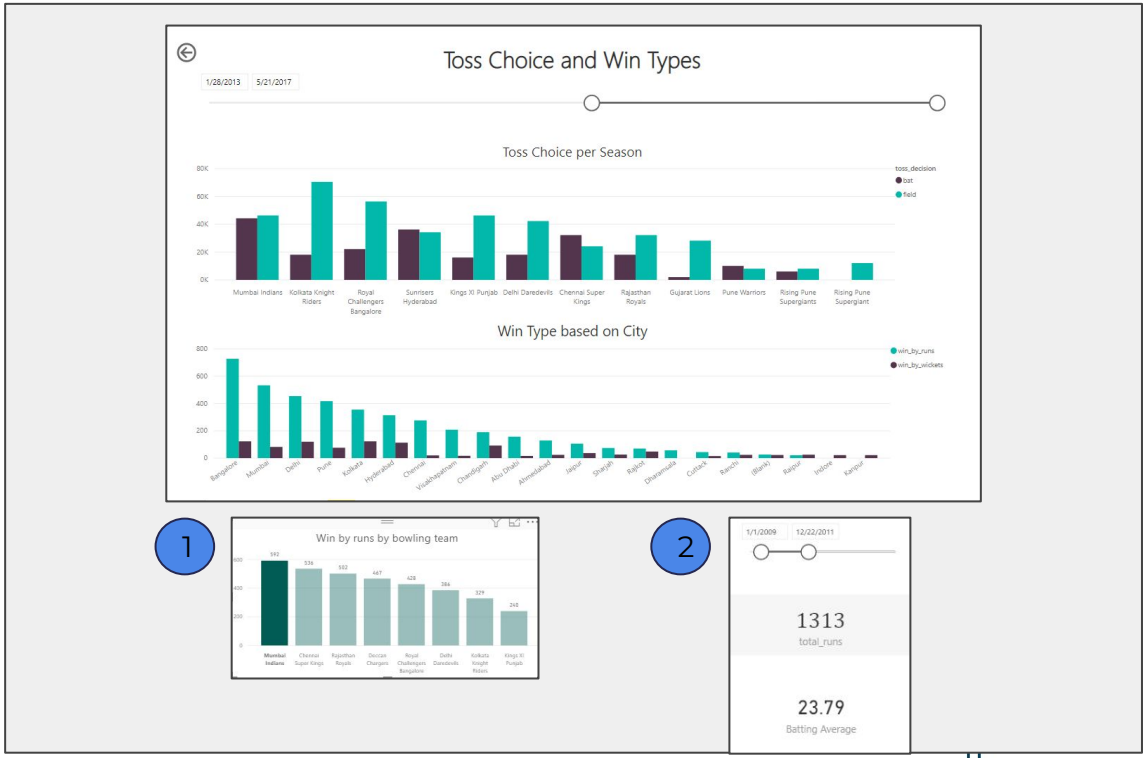
Next we can look at the 2nd page of our IPL demo dashboard - 'Toss Choice & Win Types'.

Clicking on any of the bars in the bar chart will filter the entire page according to the chosen bar.

1. You can then proceed to move the slider to select the time period that you would like to extract information from.

2. To move back to page 1 select the **arrow back button** (hold *Ctrl* and then select it) at the top of the page.

Arrow Back Button



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Conclusion

- In this train we've learnt how to:
  - Create visuals such as a filter, card, line chart, column chart, bar chart, scatter chart and treemap.
  - Create a basic dashboard
- You should be able to build a basic dashboard – as the old saying goes “practice makes perfect”.
- An exercise to test the skills you have just learnt, you can create your own dashboard using the visuals from this train. You can do this by adding them on a blank page and tweaking its layout to make the dashboard more visually appealing and interactive.
- We encourage you to practice as you explore other well built dashboards and get tips and ideas on how to polish your new-found skills.
- Once you’re comfortable with Power BI Desktop, consider looking at other options such as Tableau to further advance your visualisation skills!

Appendix

Additional resources:

- Microsoft and data visualisation
- Data visualisation in Tableau