



Smarten

Advanced Data Discovery

Powered by ElegantJ BI

Concept Manual

Smart Visualization

Business Intelligence & Advanced Data Discovery

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Disclaimer

This document is intended to support administrators, technology managers or developers using and implementing Smarten. The business needs of each organization will vary and this document is expected to provide guidelines and not rules for making any decisions related to Smarten. The overall performance of Smarten depends on many factors, including but not limited to hardware configuration and network throughput.

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1 About this document

This manual explains the concepts required to use Smart Visualization features in Smarten Advanced Data Discovery Suite.

1.1 Scope and Organization of Topic Areas

Chapter 2	Introducing ElegantJ BI - Smarten
Chapter 3	Introducing Smart Visualization
Chapter 4	Smart Visualization Process Overview
Chapter 5	Use Data from Datasets or Cubes
Chapter 6	Working with Smarten Mode ON
Chapter 7	Working with Smarten Mode OFF
Chapter 8	Exploring and Using Chart Types
Chapter 9	Configuring Charts
Chapter 10	Operations on Charts
Chapter 11	Consume
Chapter 12	Product and Support Information

1.2 Conventions Used

This manual uses typographical conventions in the text to help you distinguish between the names of files, instructions, and other important notes that are relevant during installation. For example:

- Important notes are indicated in a different font color as shown in the example below.

Note:

Trend can be applied to a Bar chart, Line chart, Combined chart, and Area type of Visualization.

- References to documents are highlighted as below:

Reference: **ElegantJ BI Concept Manual > Analytic Functions > Data Operations**

2 Introducing ElegantJ BI - Smarten

ElegantJ BI is a full-stack Business Intelligence tool that employs the “Smarten” approach to Advanced Data Discovery. The solution is composed of a comprehensive set of tools, including Self-Serve Data Preparation, Smart Visualisation, and Plug n’ Play Predictive Analytics. These tools are designed to democratize advanced analytics and to transform business users into citizen data scientists.

Self-Serve Data Preparation

Self-Serve Data Preparation allows business users to perform data preparation on their own without the assistance of IT staff or data analysts. Users are not restricted by complex tools or forced to wait for IT to deliver crucial data. Guided by smart suggestions and auto recommendations, business

users can prepare, blend, and transform data and create analysis-ready data quickly and accurately without assistance rather than waiting for central metadata prepared by IT.

Smart Data Visualization

Intuitive Smart Data Visualization tools suggest the best options for visualizing and plotting a particular set or type of data based on the nature, dimensions, and trend of data so that business users can easily select the appropriate method to clearly and quickly visualize data in a way that is meaningful to the task.

Plug n' Play Predictive Analysis

Assisted Predictive Modelling allows business users to explore predictive algorithms and models without the skill or knowledge of a data scientist or statistician. The solution considers the underlying data and use case, and suggests the best-fit algorithm. It then displays output results and data visualization accompanied by an interpretation using simple human language.

3 Introducing Smart Visualization

Smart Data Visualization allows business users to analyze, share, and present information without waiting for assistance from visualization experts or programmers. With augmented data discovery tools, business users can cut through that mountain of data to find those elusive nuggets of information that have the most impact on business results.

Smarten View smart data visualization allows business users to view and analyze data to identify a problem, clarify a root cause, and make confident decisions. Business users can interact easily with data discovery tools and analytics software and build a view that will tell a story using guided visualization and recommended data presentation so that there is no need for assistance or delays. Guided recommendations are made based on data type, volume, dimensions, patterns, and nature of data.

By combining cutting-edge technology and machine learning on the backend, with an intuitive user experience on the front end, business users can easily leverage sophisticated tools with suggestions and recommendations on how to personalize data displays to create meaningful views and collaboration.

Machine learning provides guidance to determine the visualization technique that will be the best fit for the data business users want to analyze. It allows for better understanding of data, identifies unusual patterns in data, and achieves the best output and results.

Visual Analytics tools enable users to identify relationships, patterns, trends, and opportunities and to explore detailed data with simple drill down and drill through capabilities and make sense of data from all sources, with a guided approach that allows users to identify patterns and trends, and quickly complete analysis with clear results.

4 Smart Visualization Process Overview

The process of Smart Visualization starts with identifying the data that has to be visualized. Users can visualize data from Datasets as well as Cubes and create views by simply dragging and dropping the required Dimension and Measure columns belonging to the Dataset / Cube. With Smarten mode ON, the machine learning capabilities of the system come into play, and the user is automatically presented with the best suitable chart based on data type, volume, dimensions, patterns, and nature of data. If users want more control of visualization, they can work with Smarten mode OFF and have

total control of various visualization properties, including color, shape, and size. Guided by auto-detection and auto-suggest features, users can leverage a variety of sophisticated tools to customize and personalize the visualizations as per their specific requirements. The visualizations are called SmartenView, and SmartenView objects can be viewed as stand-alone objects or be embedded within dashboards. Users can export SmartenView objects in JPG, PDF, and PNG formats.

Typical steps involved in creating a SmartenView are:

- Identify the Dataset / Cube
- Select the Dimension and Measure columns
- Work with Smarten mode ON or OFF
- Change the visualization type
- Personalize the visualization
- Apply sampling, outliers, data operations, filters, sorting, ranking, and other functions
- Use SmartenView as a stand-alone object or embed it within dashboards

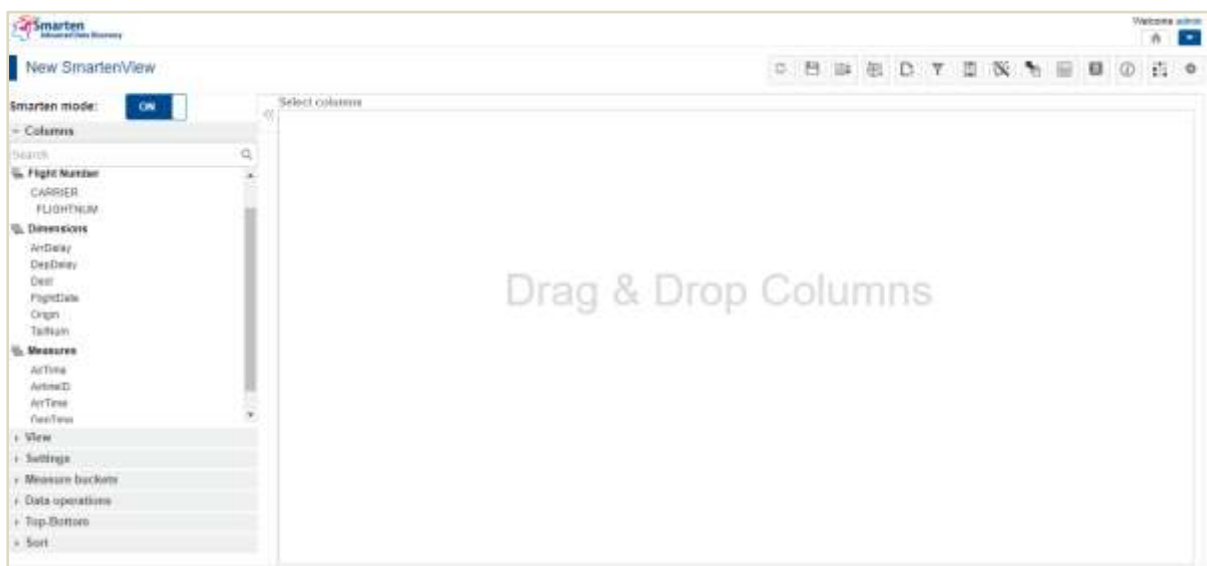
5 Use data from Datasets or Cubes

Datasets and Cubes are the main sources of data that is extracted from various data sources. Smart visualization allows users to visualize data from Datasets as well as Cubes.

Datasets are a source of analysis-ready data in the form of a columnar data structure, whereas Cubes are indexed with multidimensional data structure.

5.1 Columns

A list of Dimension columns, Measure columns, and predefined Dimension Hierarchies belonging to the Dataset or Cube is displayed. Using a simple drag and drop interface, users can select the required columns from the Dataset or Cube to create a SmartenView.



SMARTENVIEW COLUMNS

5.1.1 Dimensions

A list of all Dimension columns, including the GeoMap dimension columns and Time Series columns from the Dataset or Cube is displayed. Users can just drag and drop the required Dimension columns to create visualization.

5.1.2 Measures

A list of all Measure columns, including the User Defined Data Columns (UDDC) from the Dataset or Cube is displayed. Users can just drag and drop the required Measure columns to create visualization.

6 Working with Smarten Mode ON

Analysing particular data with the right kind of visualization is an important aspect of analytics. Generally, users have the tendency to visualize varied data with standard visualization techniques, resulting in loss of valuable insights. Working with Smarten mode ON allows users to visualize data smartly without going through the process of deciding the kind of visualization required for particular data. With Smarten mode ON, it is the system that automatically suggests the best suitable option for visualizing and plotting a particular type of data.

Smart Visualization enables users to leverage the full potential of machine learning capabilities of the system to create visualizations that are meaningful and appropriate. With an easy-to-use intuitive front-end user interface backed by machine learning technology, users are able to quickly visualize the data in the right context and without any external assistance.

Instead of using the outliner settings for plotting particular data, the user just needs to drag and drop the required Dimension and Measure columns from the Dataset or Cube and the system will automatically render the best suitable visualization based on data type, volume, dimensions, patterns, and nature of data. For example, the system will recommend a map as the best type of visualization for data containing geographic information.

Users have an option to view the same data in various other types of visualizations even when Smarten mode is ON.

7 Working with Smarten Mode OFF

Working with Smarten mode OFF allows users to have more control on what and how they want to visualize. By using Outliner settings, users can decide the placement of columns in the visualization and provide various visualization properties, including color, shape, and size of the charts as per their requirement.

7.1 Outliner

Outliner is a tool that allows users to decide the placement of Dimension and Measure columns to create visualization. By simple drag and drop of Dimension and Measure columns in quadrants of Rows, Columns, X-Axis, Y-Axis, and Legend, users can have more control of the visualization.

The type of visualization rendered is based on the placement and number of these columns in the outliner.

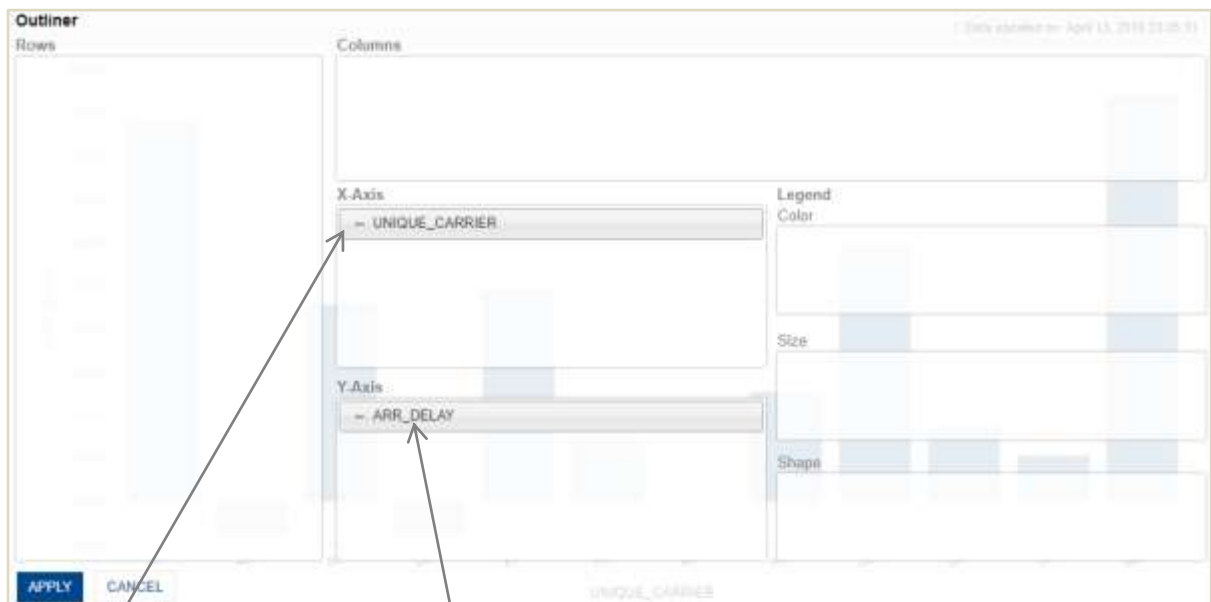
For example, let us consider data containing information of daily flights originating from and landing at various airports in the USA along with their Carrier (Unique_Carrier), departure delay (Dep_Delay), and arrival delay (Arr_Delay). Shown below are the renderings of a Bar chart with respect to different outliner settings.

Horizontal bar chart—Outliner settings 1:

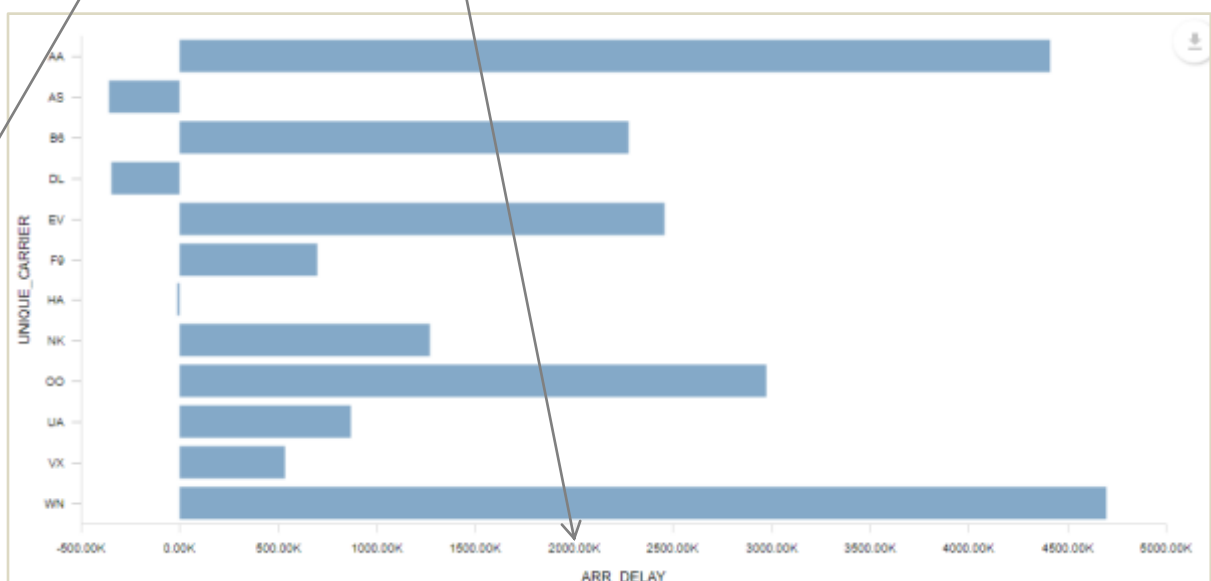
Outliner quadrant	Data column
Rows	-
Columns	-
X-Axis	Unique_Carrier
Y-Axis	Arr_Delay
Legend	
Color	-
Size	-
Shape	-

Result:

The Horizontal bar chart shown below displays the arrival delay for each Carrier. The values of “Unique_Carrier” will be plotted on the X-Axis and values of “Arr_Delay” will be plotted on the Y-Axis.



OUTLINER SETTINGS



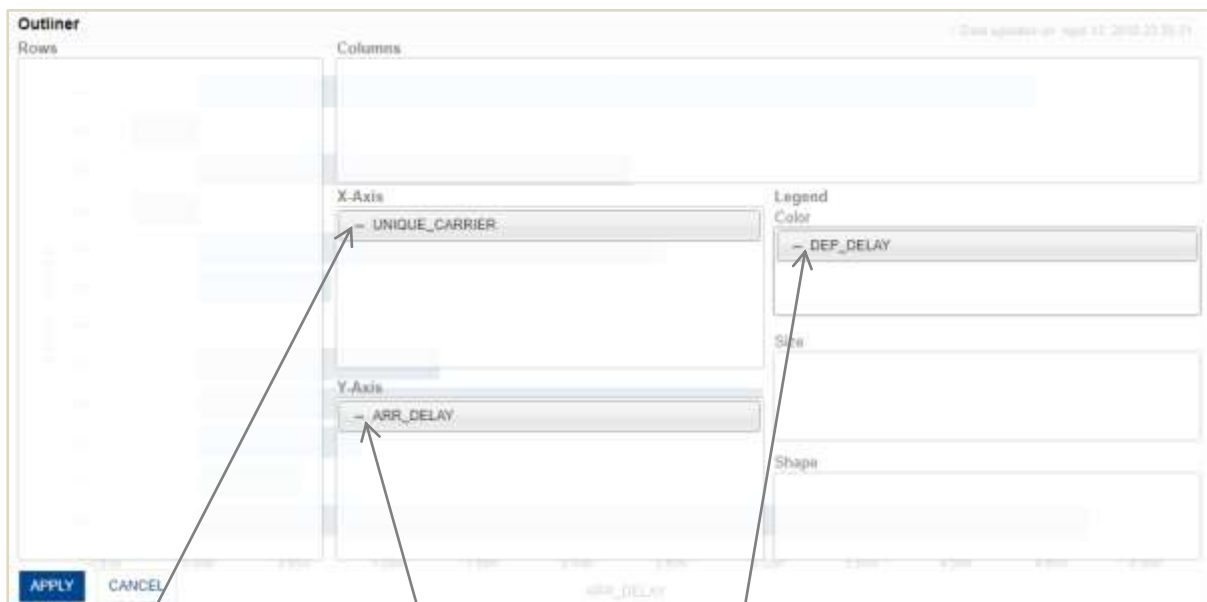
HORIZONTAL BAR CHART

Horizontal bar chart—Outliner settings 2:

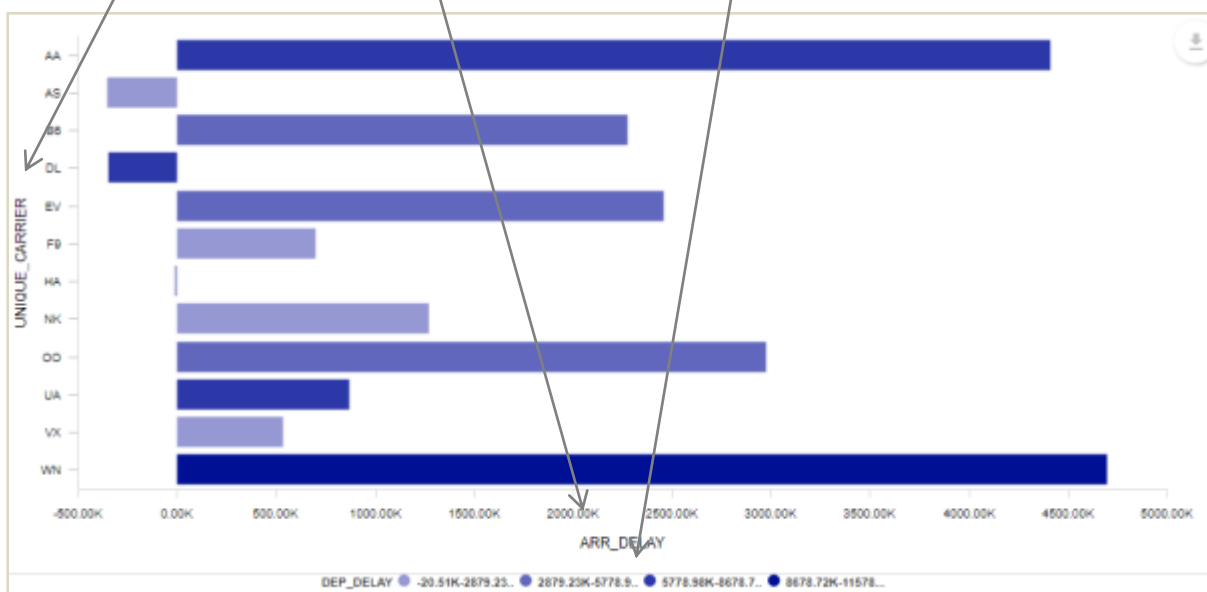
Outliner quadrant	Data column
Rows	-
Columns	-
X-Axis	Unique_Carrier
Y-Axis	Arr_Delay
Legend	
Color	Dep_Delay
Size	-
Shape	-

Result:

The Horizontal bar chart shown below displays the arrival delay for each Carrier, and the color of the bars will depend on the values of “Dep_Delay.” The system automatically creates buckets of “Dep_Delay” values, and each bucket is represented by a unique color.



OUTLINER SETTINGS



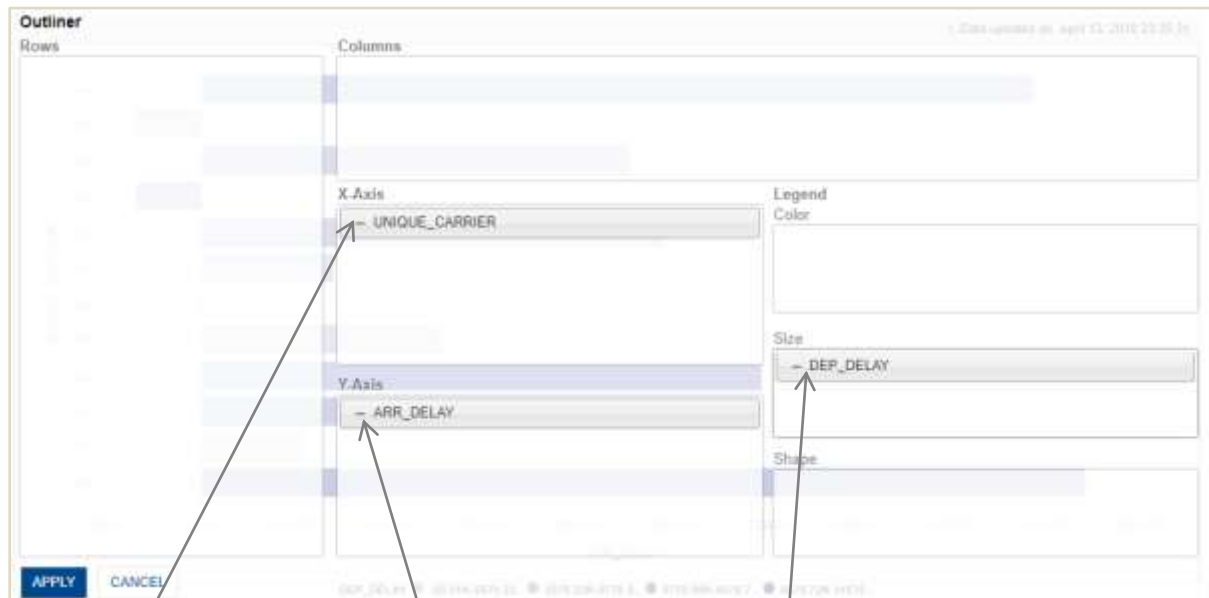
HORIZONTAL BAR CHART

Horizontal bar chart—Outliner settings 3:

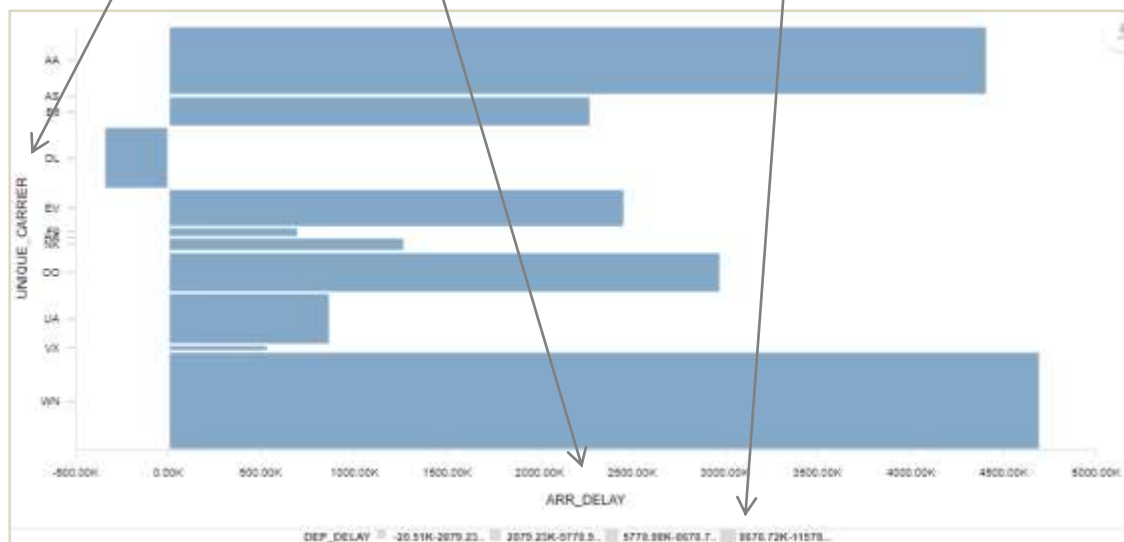
Outliner quadrant	Data column
Rows	-
Columns	-
X-Axis	Unique_Carrier
Y-Axis	Arr_Delay
Legend	
Color	-
Size	Dep_Delay
Shape	-

Result:

The Horizontal bar chart shown below displays the arrival delay for each Carrier with the thickness of the bars depending on the values of “Dep_Delay.” The system automatically creates buckets of “Dep_Delay” values, and each bucket is represented by a particular size. The thicker the bar, the more delay in departure of the flight.



OUTLINER SETTINGS



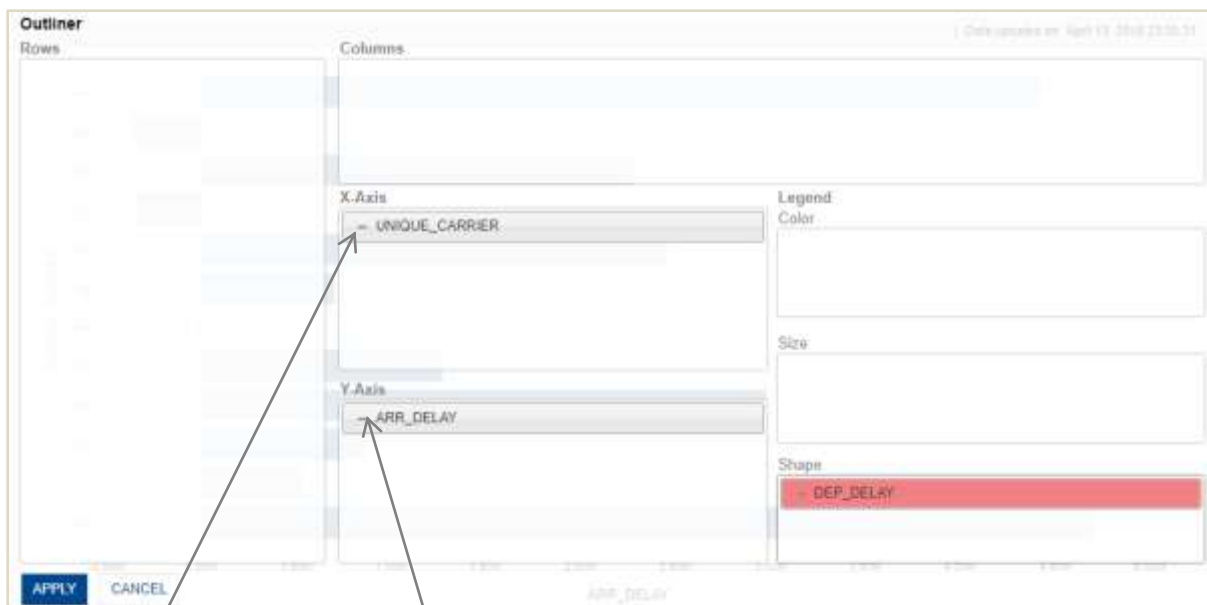
HORIZONTAL BAR CHART

Horizontal bar chart—Outliner settings 4:

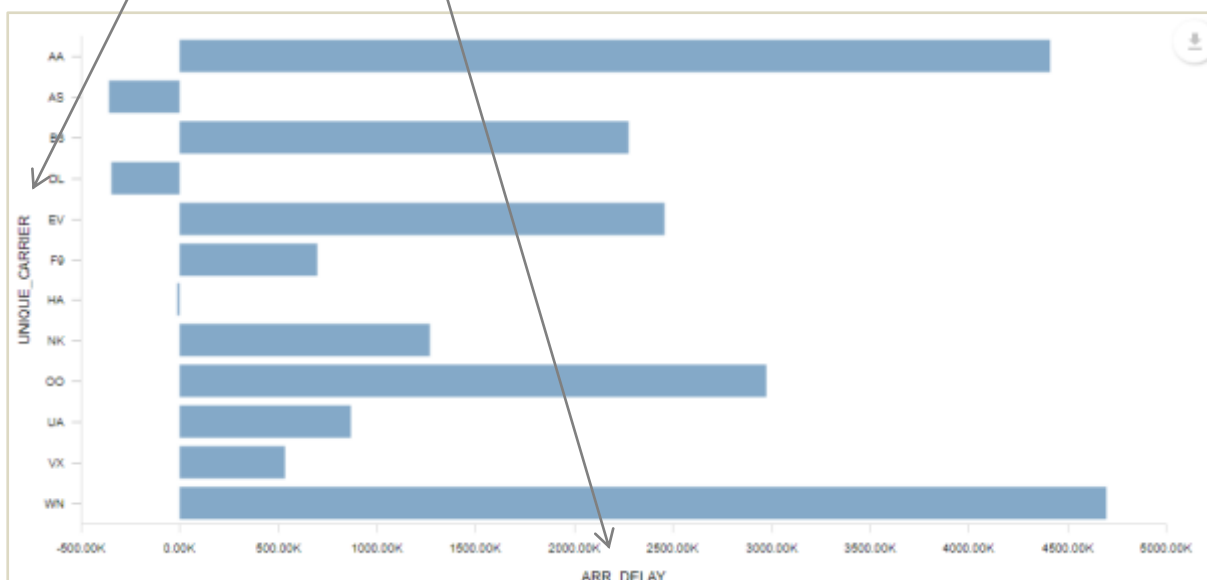
Outliner quadrant	Data column
Rows	-
Columns	-
X-Axis	Unique_Carrier
Y-Axis	Arr_Delay
Legend	
Color	-
Size	-
Shape	Dep_Delay

Result:

While creating a Bar chart, if a user places a column in the Legend-Shape quadrant of the Outliner, the column will be highlighted in Red color, as shapes are not applicable while creating a Bar chart. The particular column will be ignored while rendering the chart.



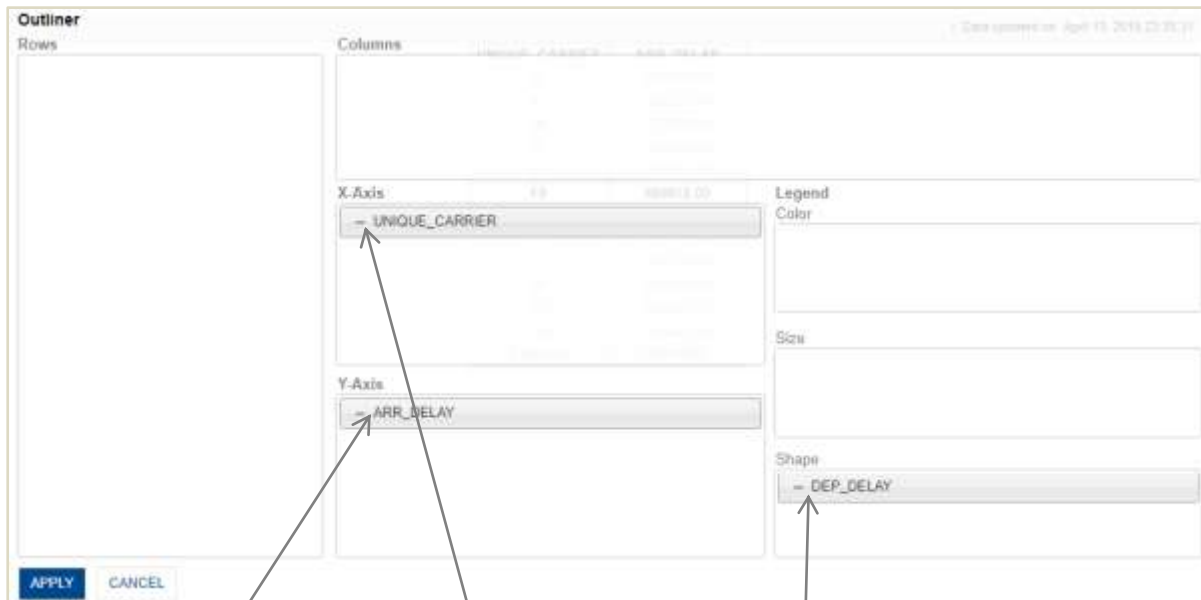
OUTLINER SETTINGS



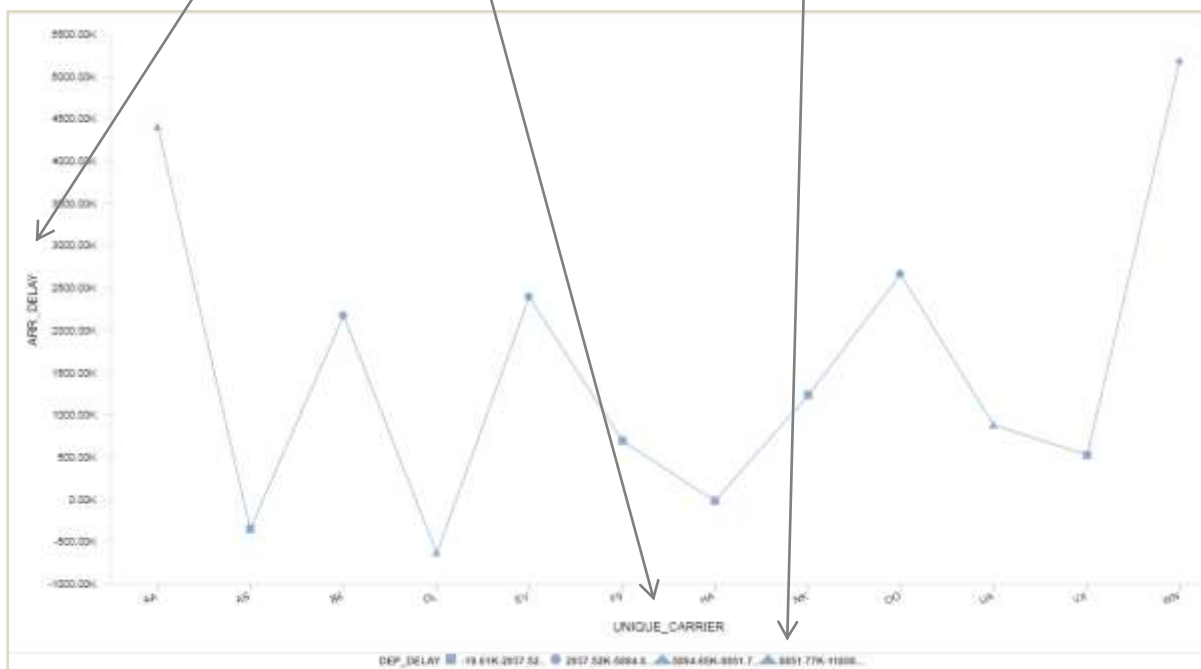
HORIZONTAL BAR CHART

But the same Outliner settings can be used to visualize the data through a Line chart or a Map, as shapes are applicable for both types of visualization.

The Line chart shown below displays the arrival delay for each Carrier with different shapes representing different values of “Dep_Delay.” The system automatically creates buckets of “Dep_Delay” values, and each bucket is represented by a particular shape.



OUTLINER SETTINGS



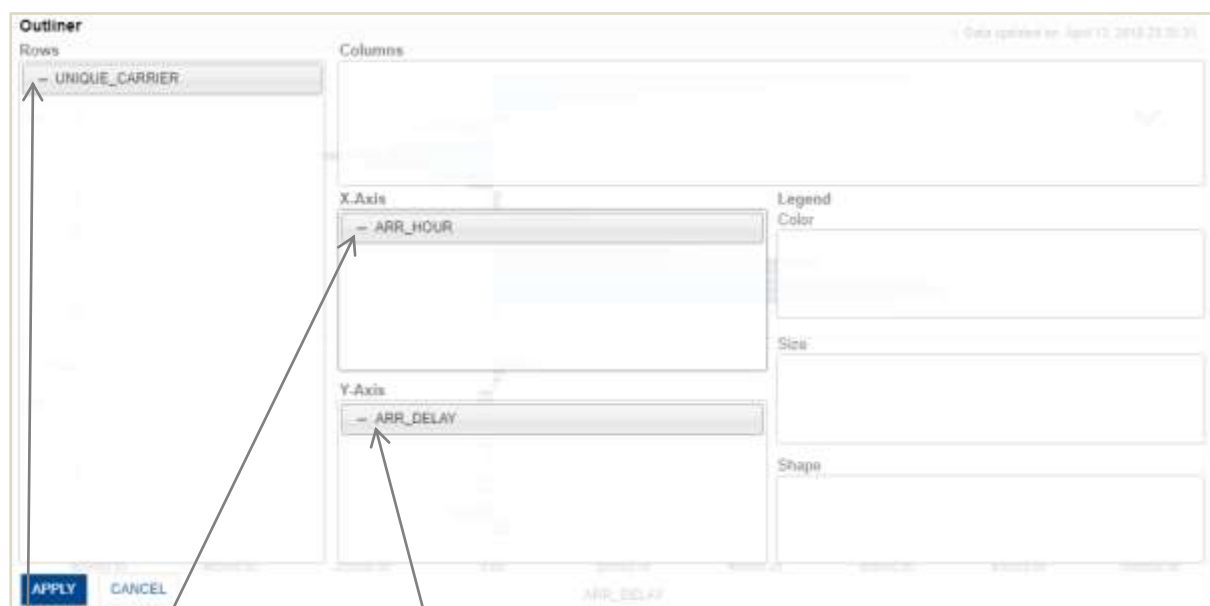
LINE CHART

Horizontal bar chart—Outliner settings 5:

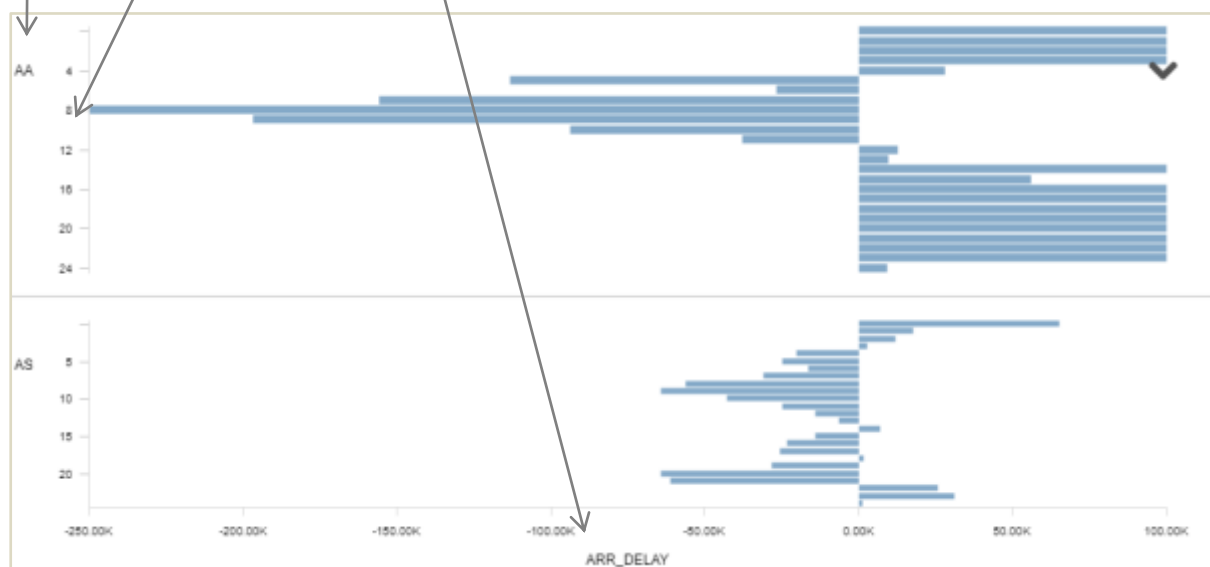
Outliner quadrant	Data column
Rows	Unique_Carrier
Columns	-
X-Axis	Arr_Hours
Y-Axis	Arr_Delay
Legend	
Color	-
Size	-
Shape	-

Result:

A carrierwise Horizontal bar chart will be rendered as follows:



OUTLINER SETTINGS



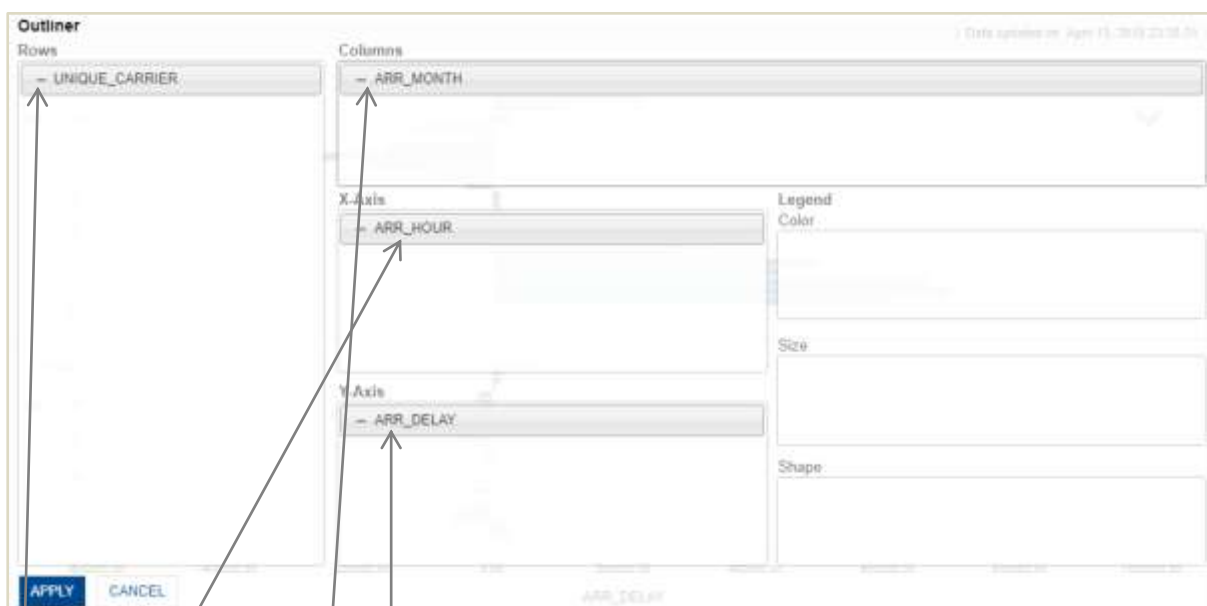
HORIZONTAL BAR CHART

Horizontal bar chart—Outliner settings 6:

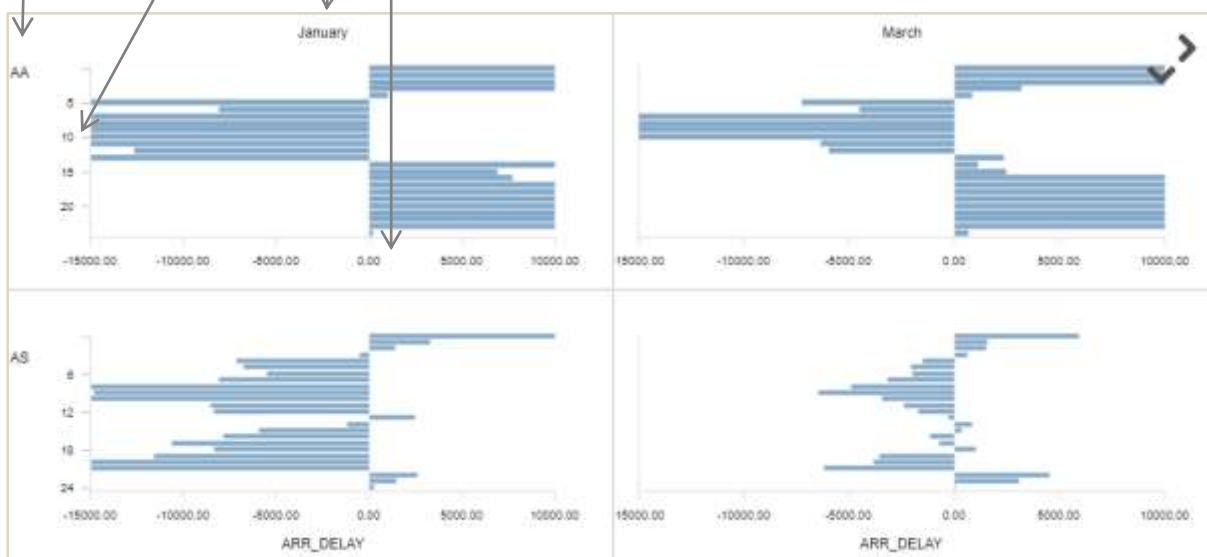
Outliner quadrant	Data column
Rows	Unique_Carrier
Columns	Arr_Month
X-Axis	Arr_Hours
Y-Axis	Arr_Delay
Legend	
Color	-
Size	-
Shape	-

Result:

A carrierwise Horizontal bar chart with a column for each month will be rendered as follows:



OUTLINER SETTINGS



HORIZONTAL BAR CHART

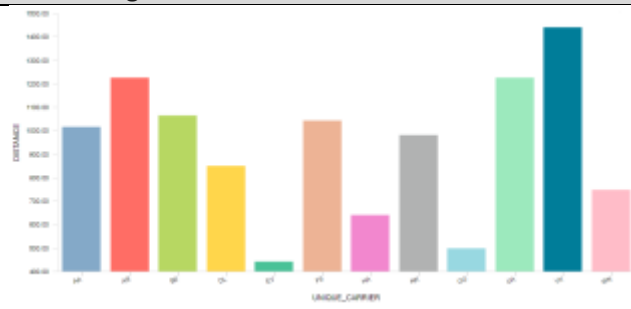
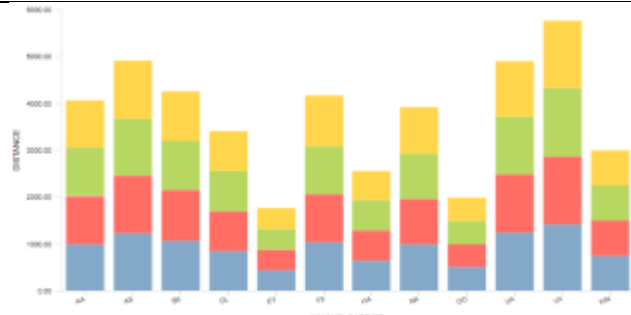
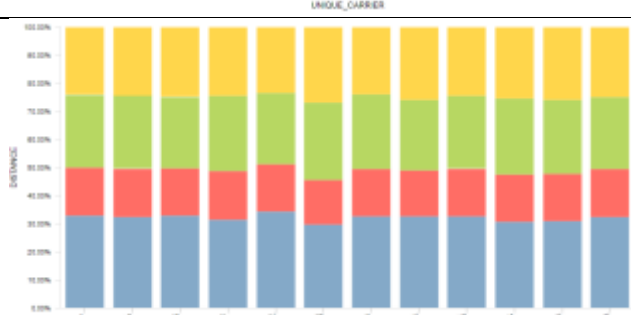


By using these powerful Outliner options, users can enjoy more flexibility and total control over the kinds of visualizations they want to create for their data.

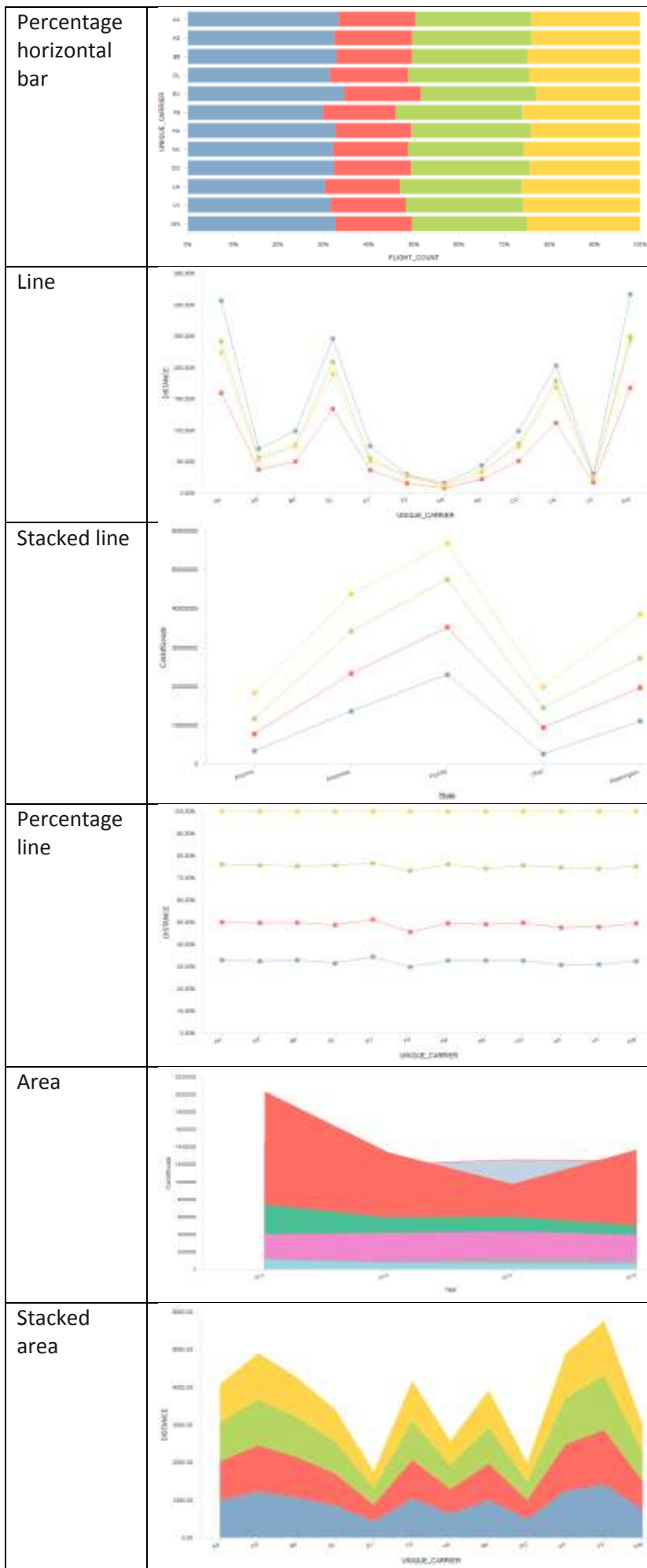
8 Exploring and using chart types

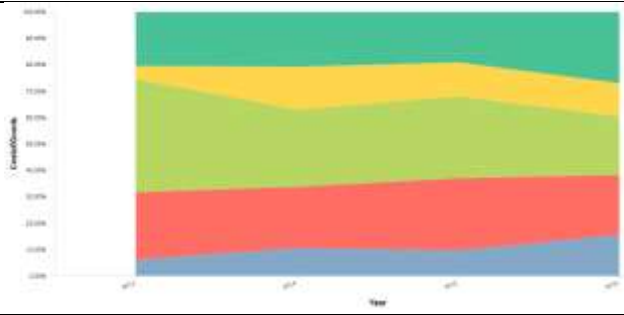

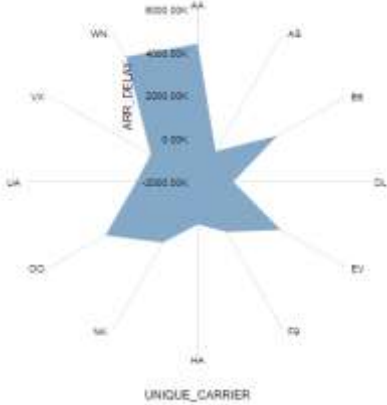
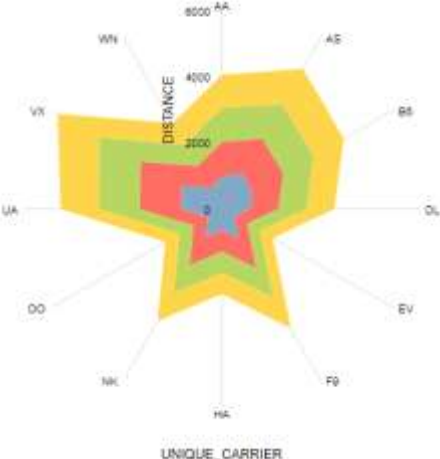
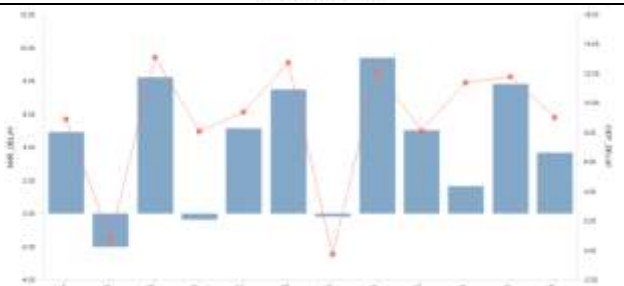
Smart visualization allows users to visualize their data with a wide range of visualization types, including charts, graphs, and maps. Apart from the system recommended visualization, users can visualize the same data with other possible charts.

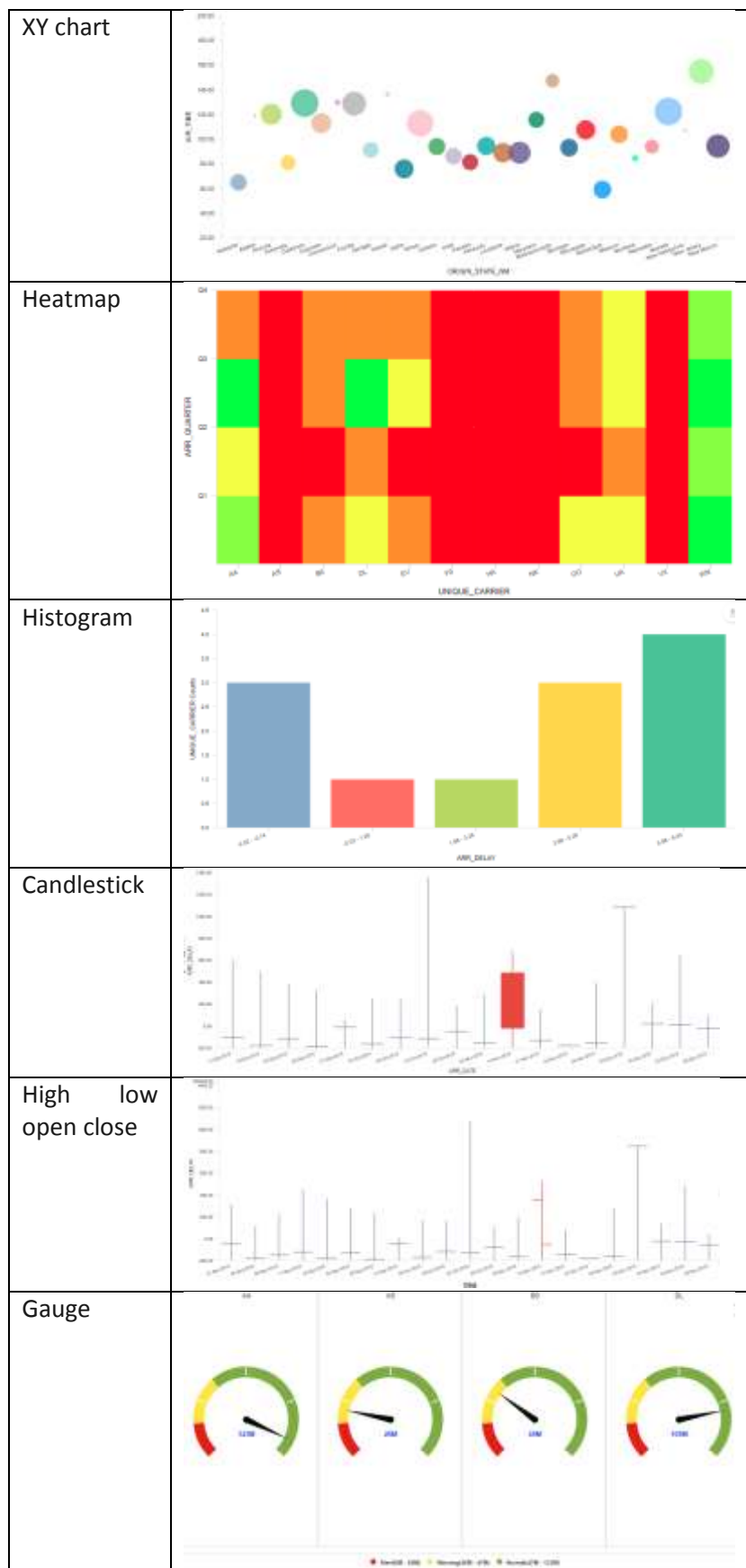
8.1 Supported chart types

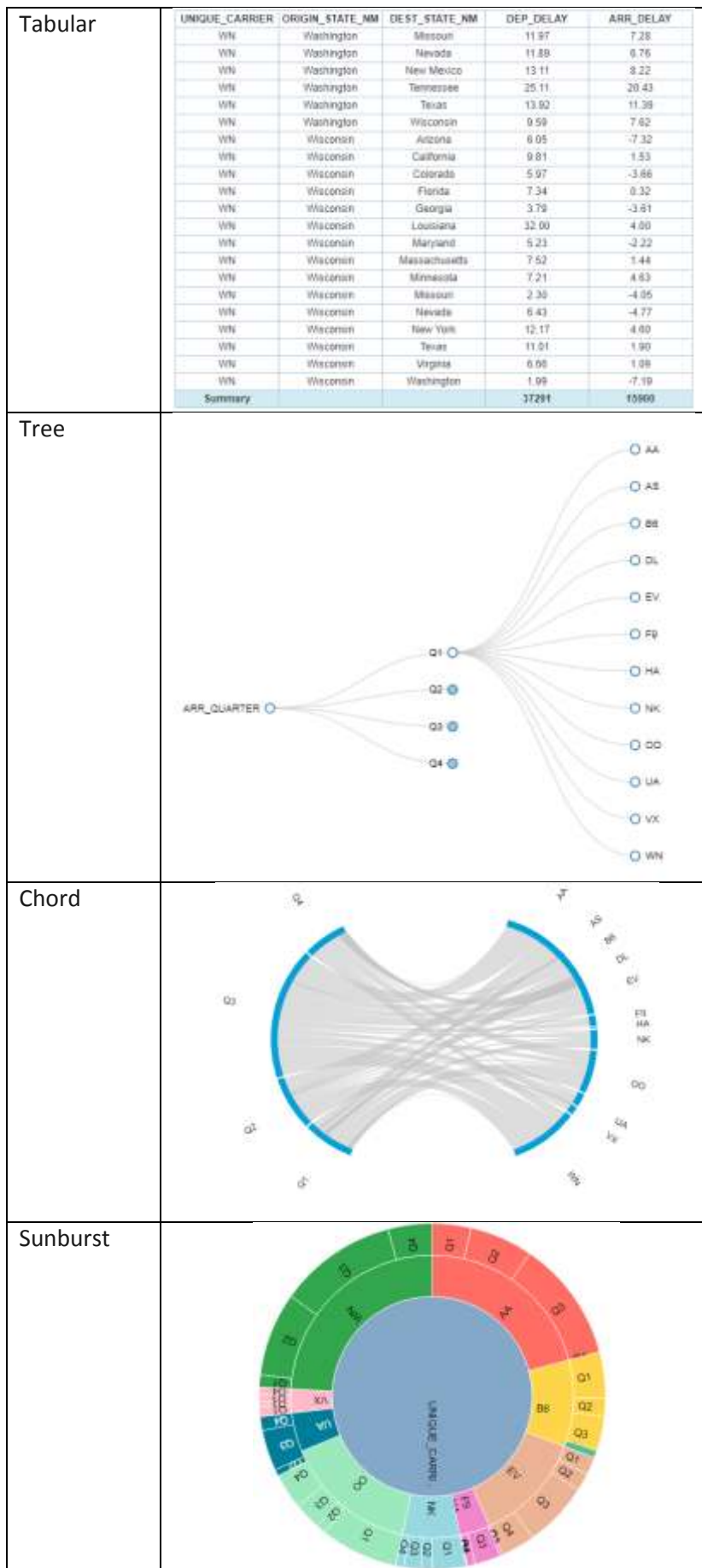
Shown below is the list of chart types supported by Smart Visualization:


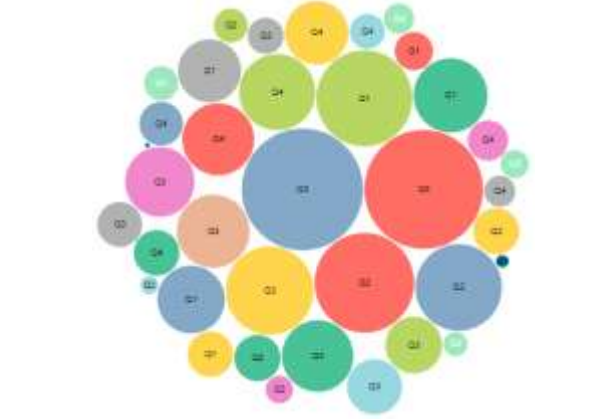
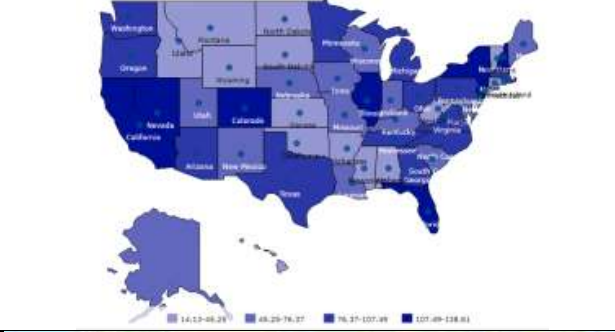

Chart type	Chart image
Vertical bar	
Stacked vertical bar	
Percentage vertical bar	
Horizontal bar	
Stacked horizontal bar	



Percentage area	
Pie	
Radar	
Stacked radar	
Combined chart	

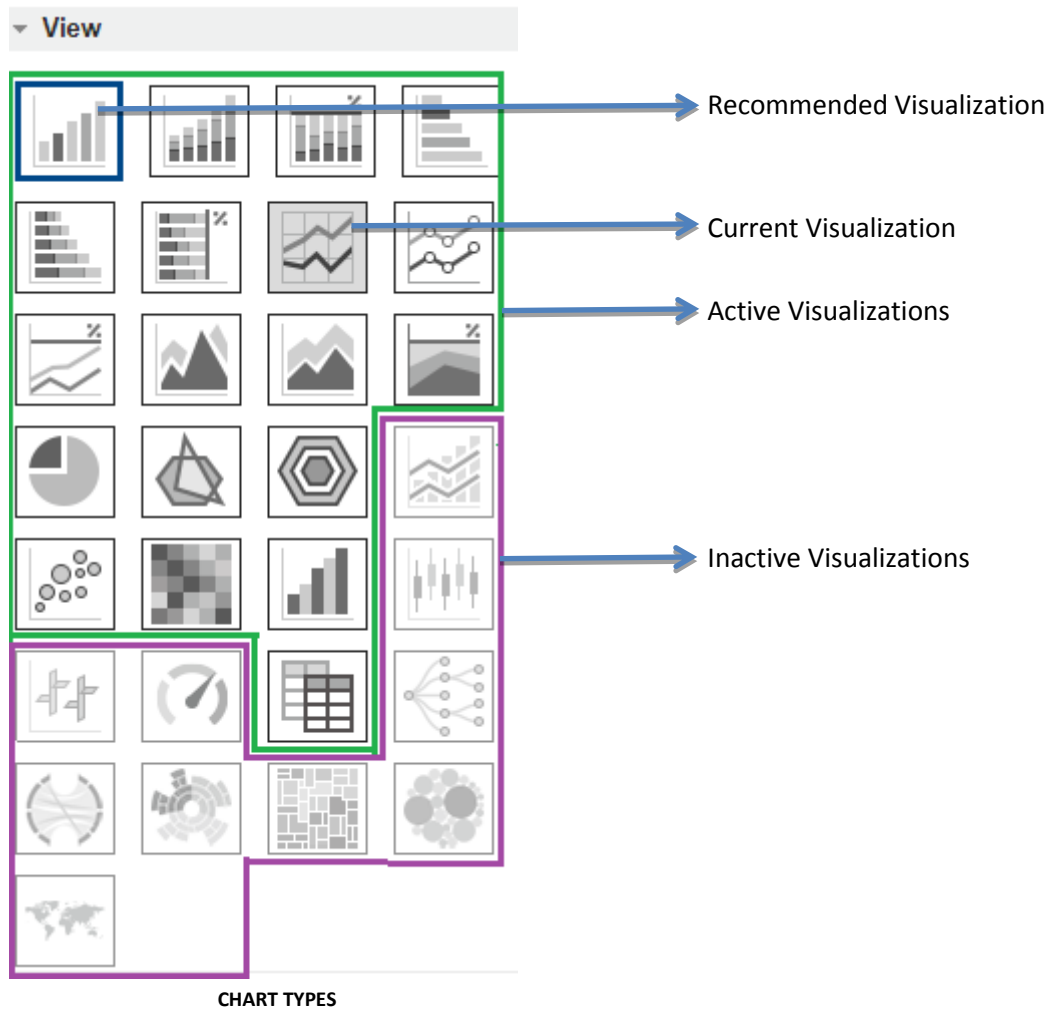




Hierarchy Tree	
Bubble	
Map	
Google map	

8.2 Recommendations and restrictions

Smart Visualization recommends the best suitable option for visualizing and plotting a particular data depending on its type, volume, dimensions, patterns, and nature. Recommended visualization can be easily identified by a dark blue border. Some visualization types may or may not be possible for the same data. Visualizations that are possible will be displayed as active, whereas the rest will remain inactive. Users can select from active visualizations to visualize the same data differently. A visualization that is currently being rendered on the screen can be identified by a grey shaded icon.



9 Configuring Charts

Smart visualization allows users to configure visualizations and personalize them as per their requirement. By using a wide range of available options, users can configure the visualizations quickly and easily.

9.1 Basic configuration

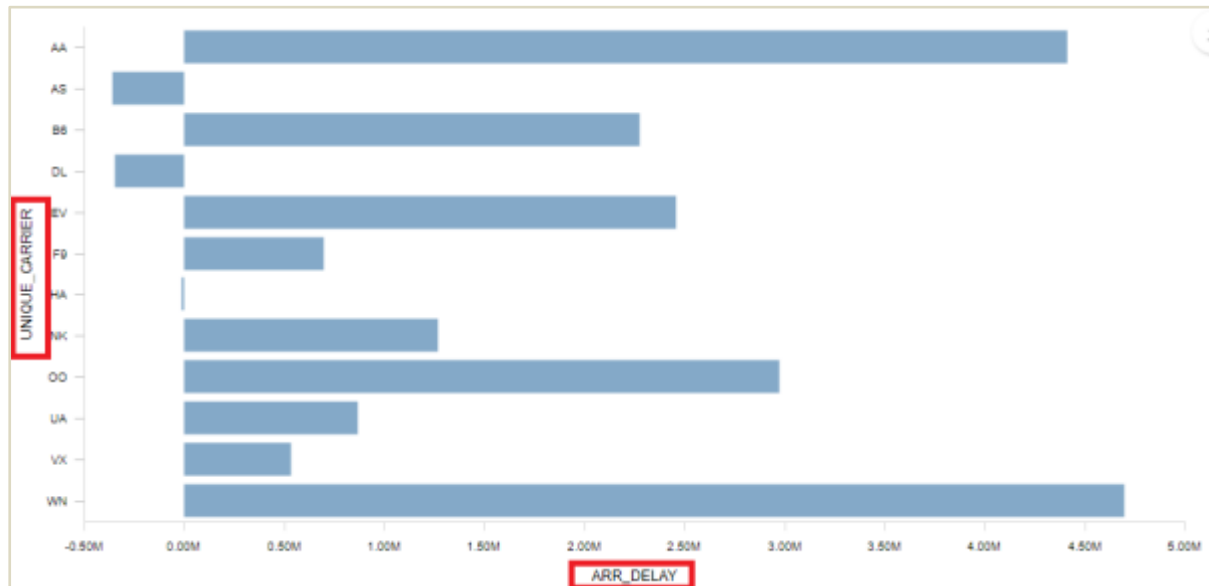
Users can configure various aspects of visualization, such as Title, Label, Format, Legend, and Trend. Visualizations can be configured depending upon visualization types. For example, users cannot configure trends for a Radar chart or a Pie chart, but the same can be done for a Bar chart.

Let us consider data containing information of daily flights originating from and landing at various airports in the USA along with their Carrier (Unique_Carrier), departure delay (Dep_Delay), and arrival delay (Arr_Delay). Shown below are the renderings of a Bar chart with various configurations.

- **Title**

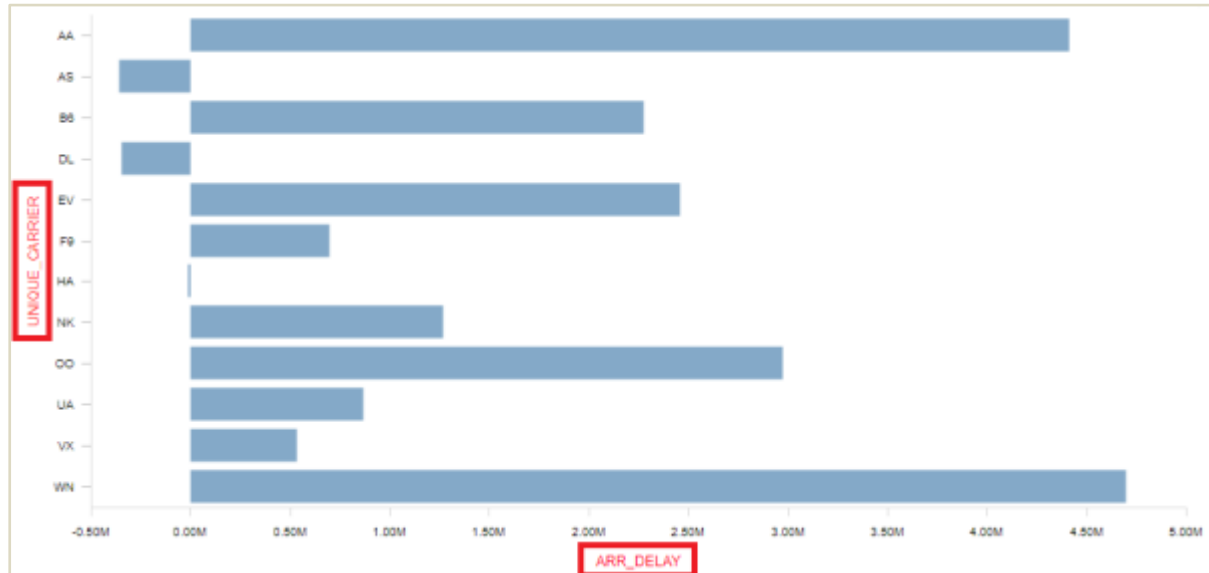
Shown below is the before and after scenario for a Bar chart after changing the font color of the titles belonging to the category axis and value axis from Black to Red:

Before:



HORIZONTAL BAR CHART

After:

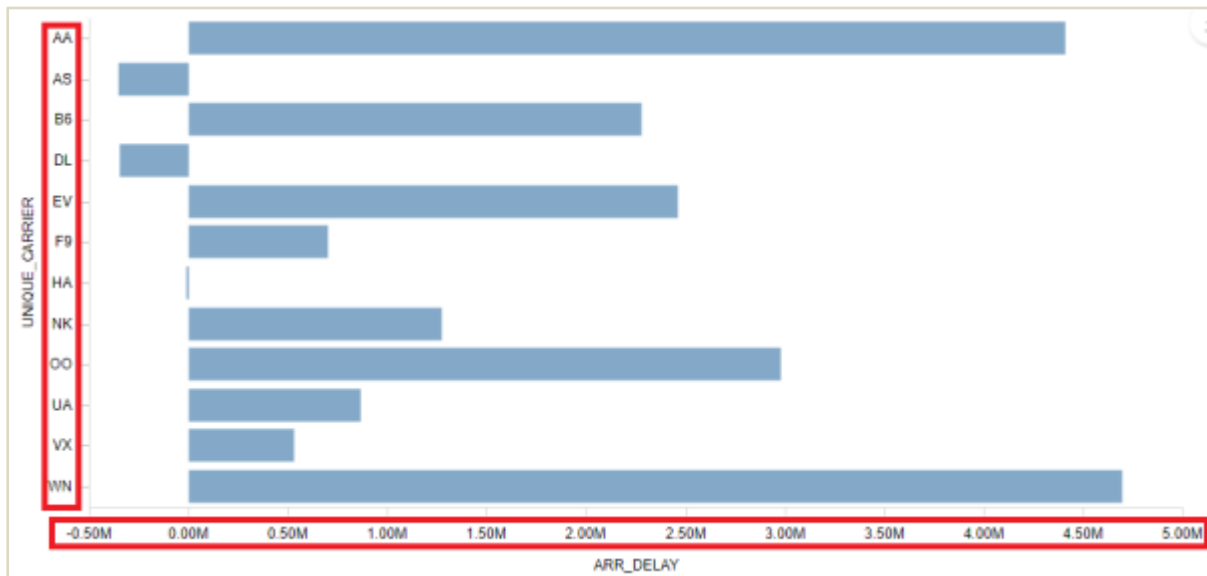


HORIZONTAL BAR CHART

- **Label**

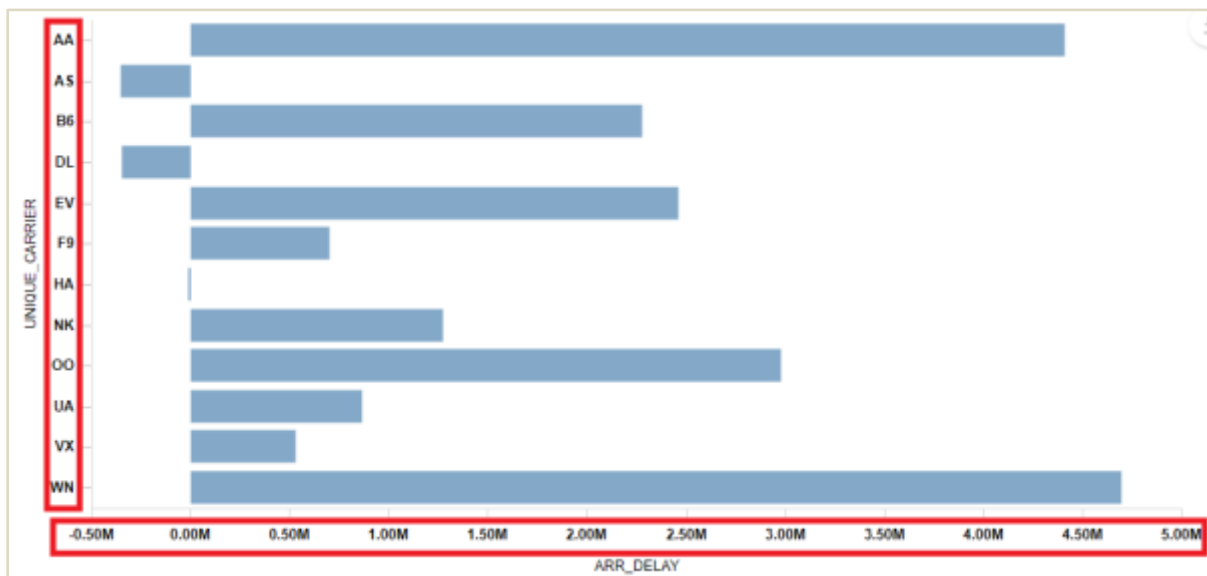
Shown below is the before and after scenario for a Bar chart after changing the font style of the labels of the category axis and value axis to bold:

Before:



HORIZONTAL BAR CHART

After:

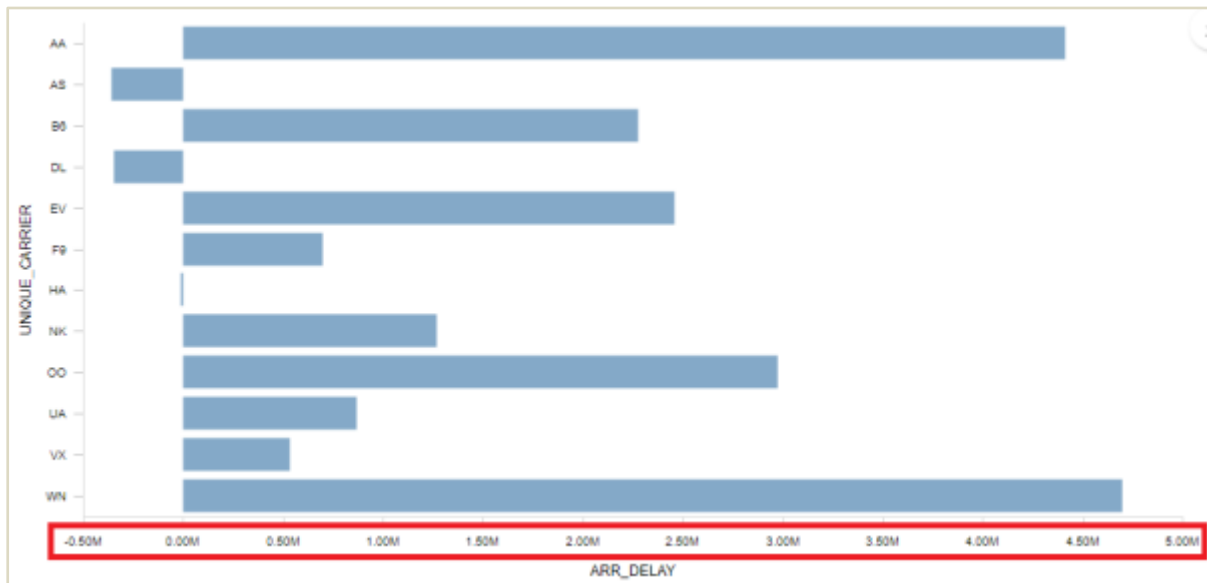


HORIZONTAL BAR CHART

- **Format**

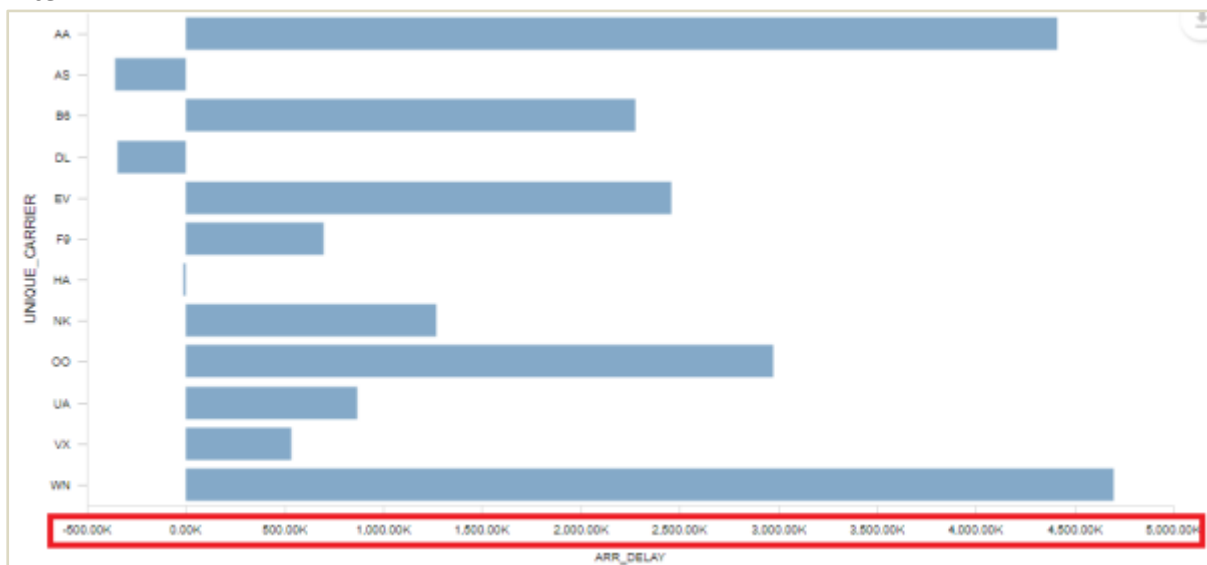
Shown below is the before and after scenario for a Bar chart after changing the number format of Arr_Delay values:

Before:



HORIZONTAL BAR CHART

After:

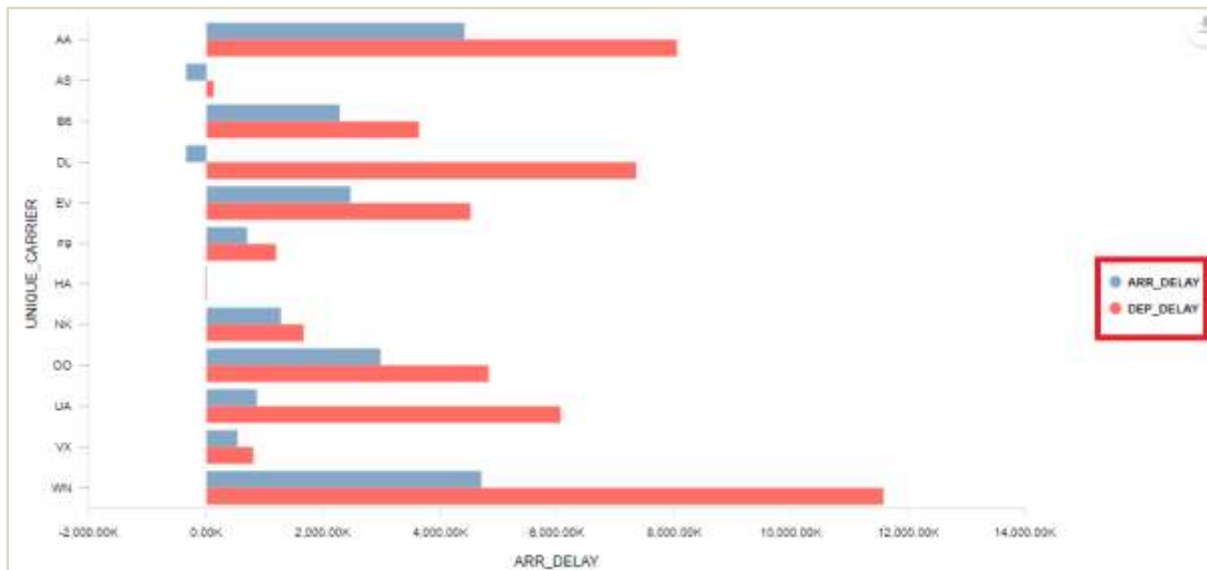


HORIZONTAL BAR CHART

- **Legend**

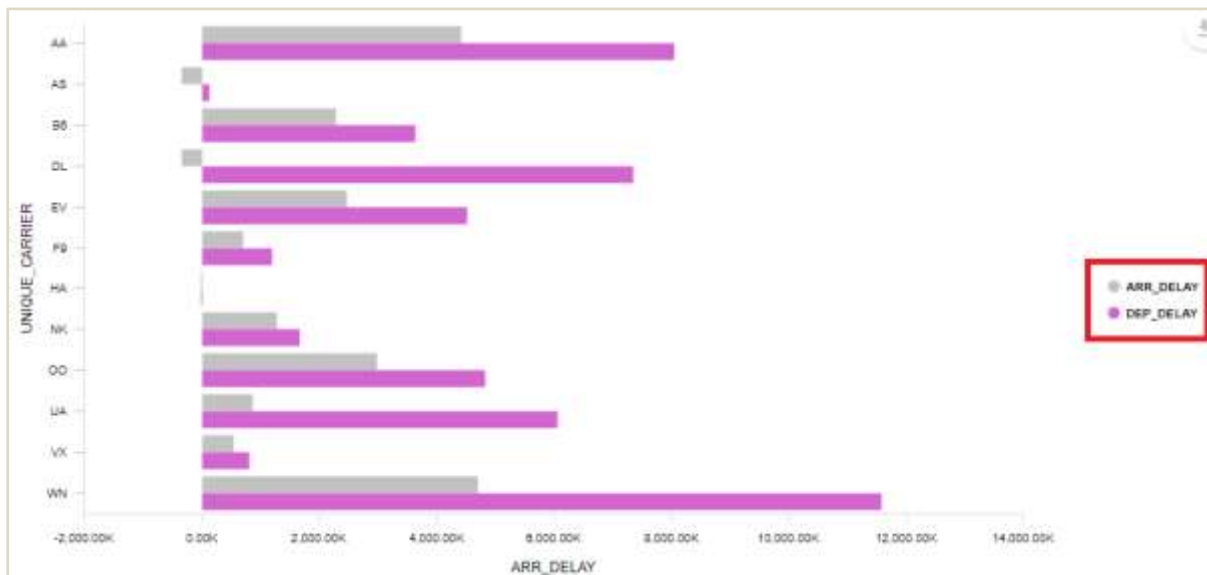
Shown below is the before and after scenario for a Bar chart after configuring the color combination for the legend:

Before:



HORIZONTAL BAR CHART

After:

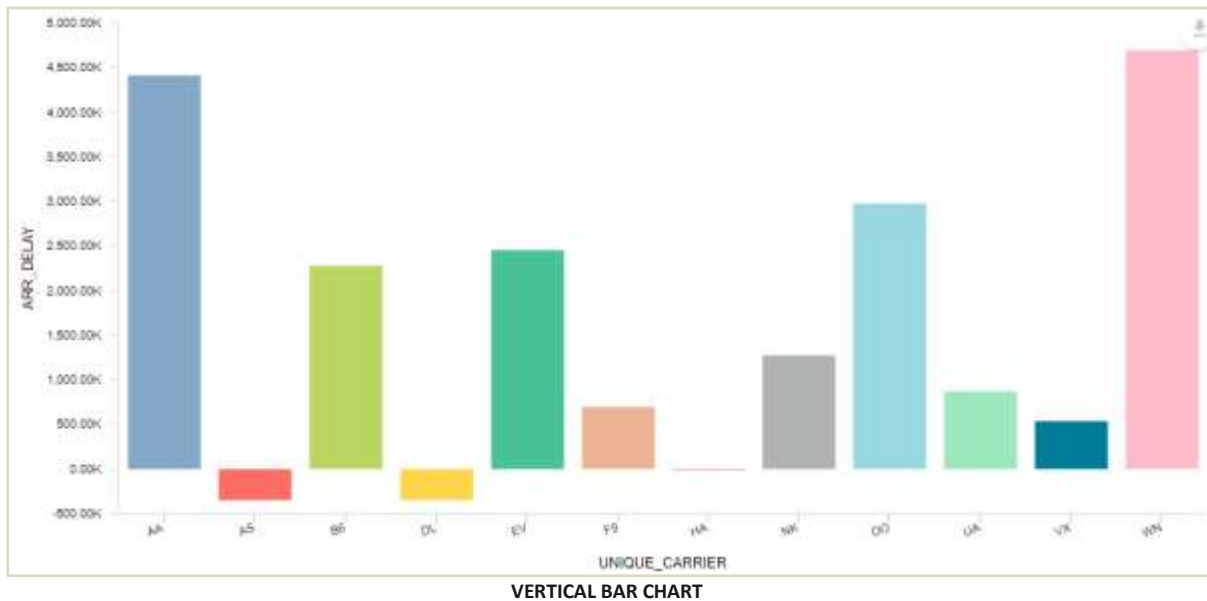


HORIZONTAL BAR CHART

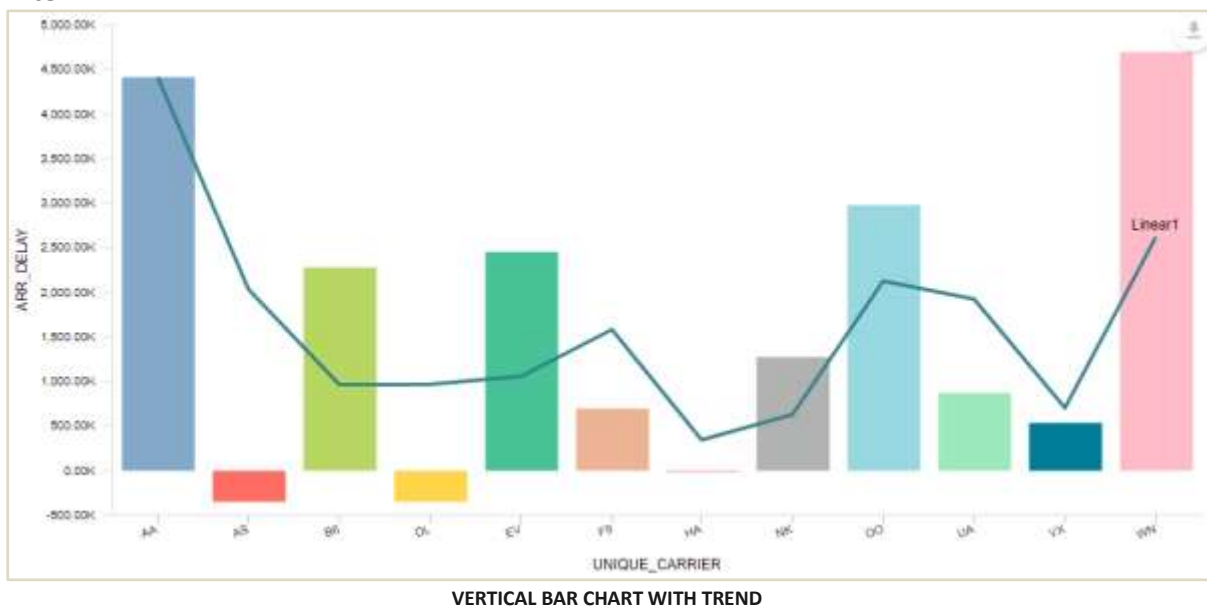
- **Trend**

Shown below is the before and after scenario for a Bar chart after configuring trend to moving average for Unique_Carrier:

Before:



After:



Note:

Trend can be applied to a Bar chart, Line chart, Combined chart, and Area type of Visualization.

9.2 Settings

Users can enable or disable certain properties of visualization and immediately view their effect on the visualization. Properties are applicable depending upon the type of visualization and certain other factors. For example, the property to "Enable zoom" is available for Bar charts but not for Pie charts or Radar charts. Similarly, although the property to "Enable pagination" is available for Bar charts, it is applicable only if the chart contains multiple pages.

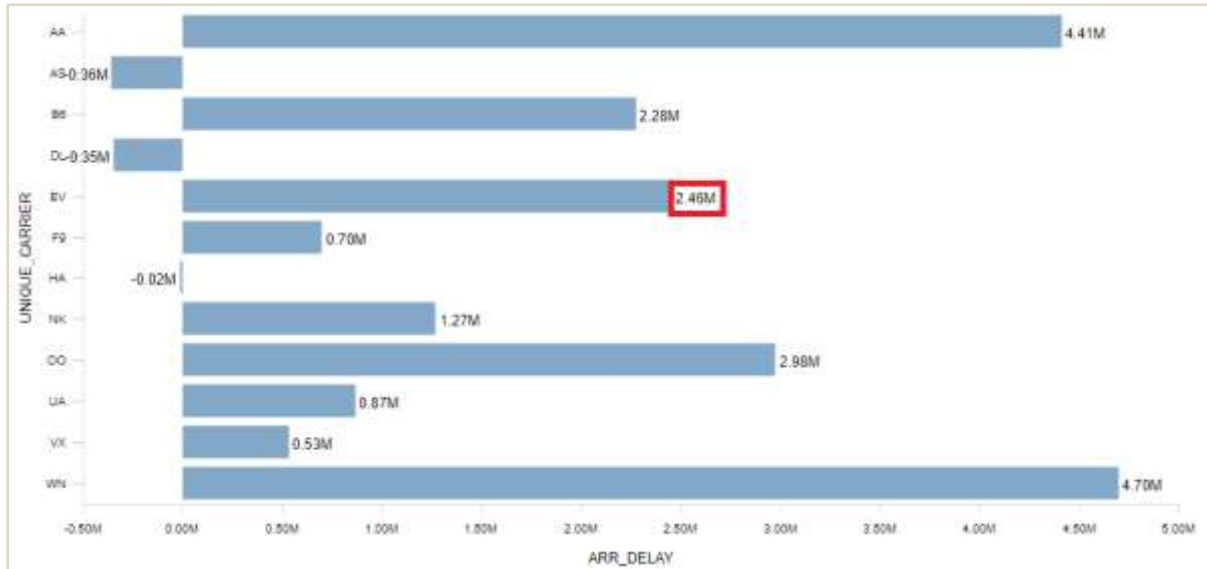
9.2.1 Show all data value

This property allows users to display or hide all the data values in the visualization.

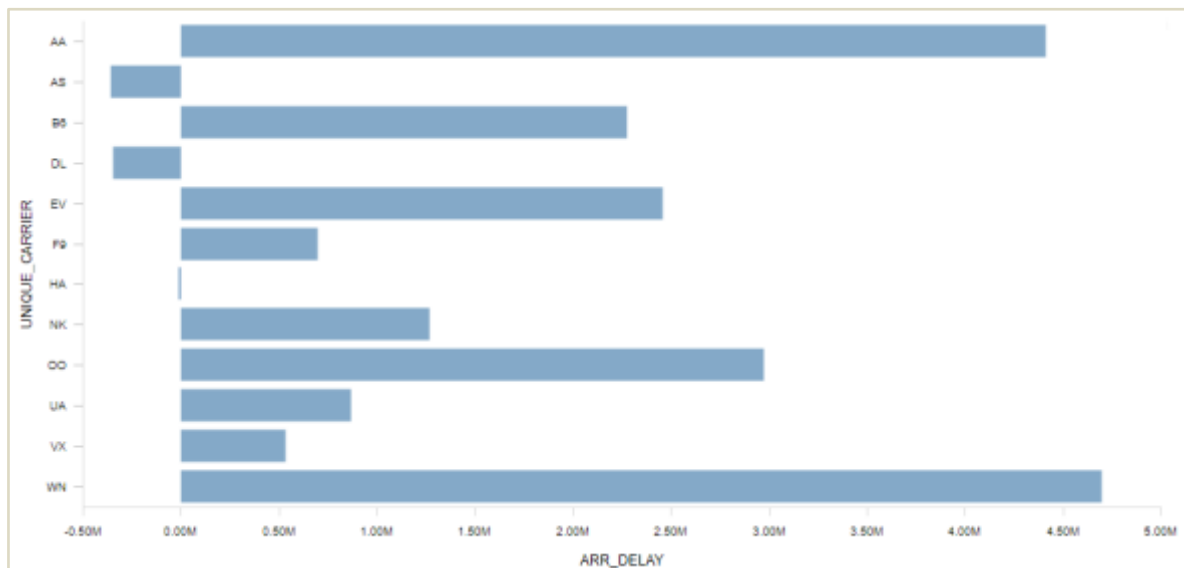
Note:

This property is not applicable for Tabular, Tree, Chord, Sunburst, Hierarchy tree, and Bubble types of visualization.

Shown below is an example of a Horizontal bar chart with “Show all data value” as enabled and disabled:



QUICK SETTINGS—SHOW ALL DATA VALUE (ENABLED)



QUICK SETTINGS—SHOW ALL DATA VALUE (DISABLED)

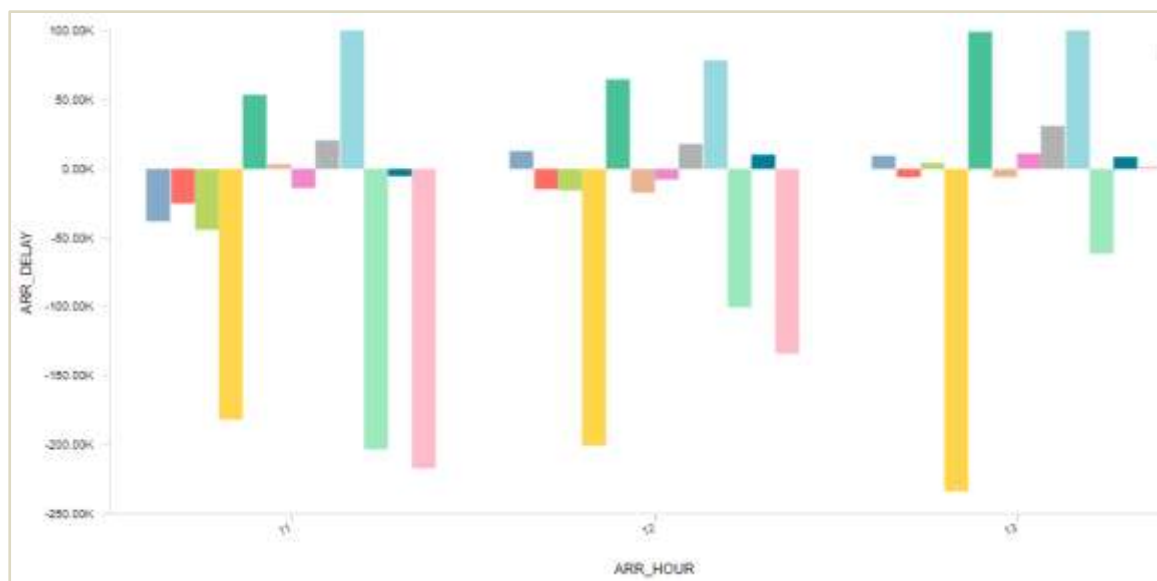
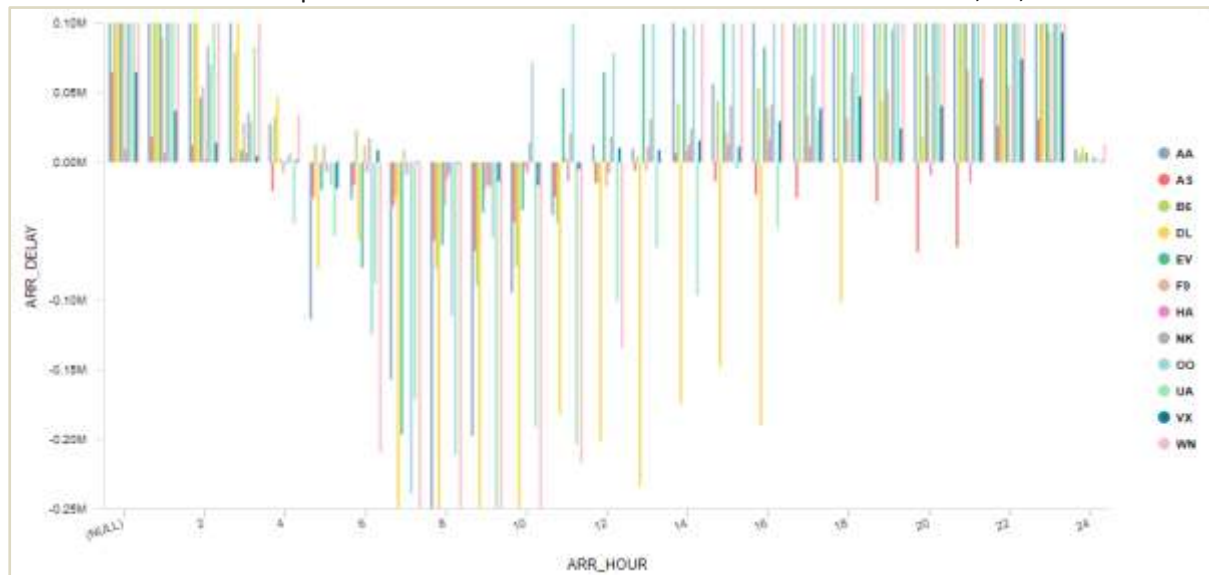
9.2.2 Enable zoom

This property allows users to enable or disable zooming in to the visualization. It is particularly helpful when there is a lot of data displayed on the chart. Users can zoom in to a particular section on the chart and view it clearly in close-up. By default, this property is enabled.

Note:

This property is not applicable for a Pie chart, Radar charts, Tabular, Tree, Gauge, Chord, Sunburst, Hierarchy tree, Map, and Bubble type of visualizations.

Shown below is an example of a Vertical bar chart with zoom in to arrival hour 11, 12, and 13:



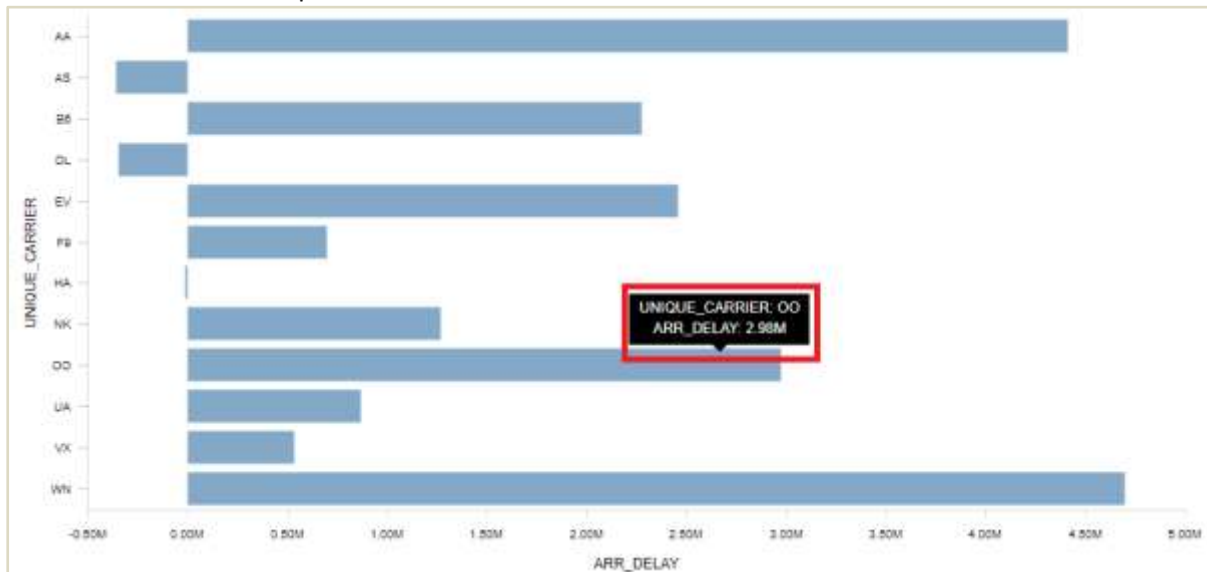
9.2.3 Enable mouse over

This property enables users to display or hide values on the visualization whenever a user hovers over the chart using a mouse. By default, this property is enabled.

Note:

This property is not applicable for Tabular, Tree, Gauge, Chord, Sunburst, Hierarchy tree, Map, and Bubble type of visualizations.

Shown below is an example of a Horizontal bar chart with values on mouseover:



QUICK SETTINGS – ENABLE MOUSE OVER

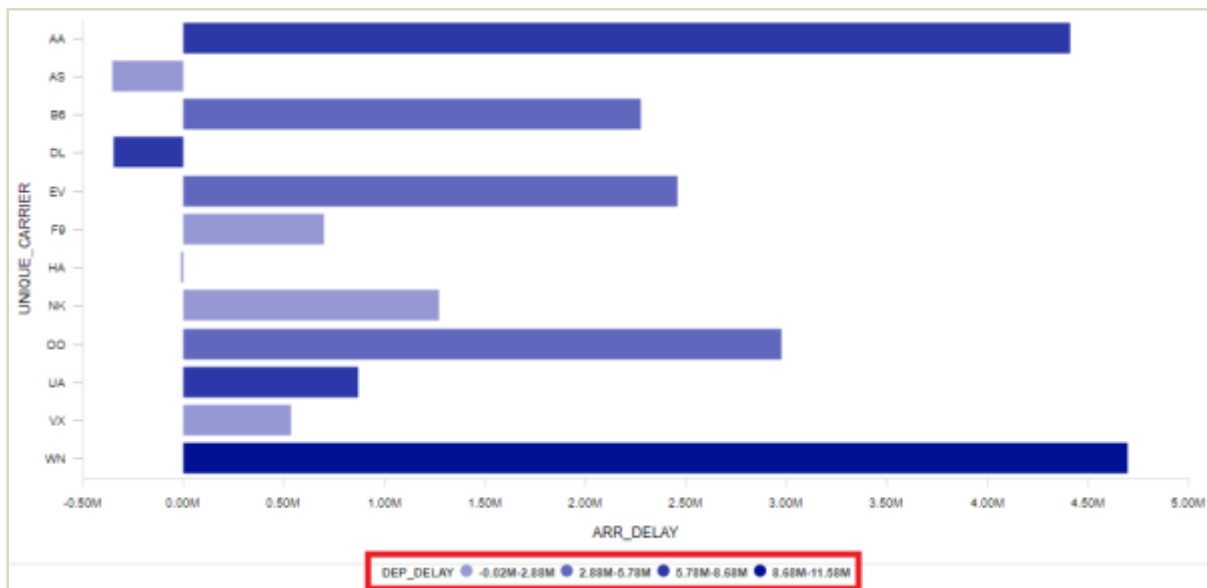
9.2.4 Show legend

This property enables users to show or hide the legend in the visualization. By default, this property is enabled.

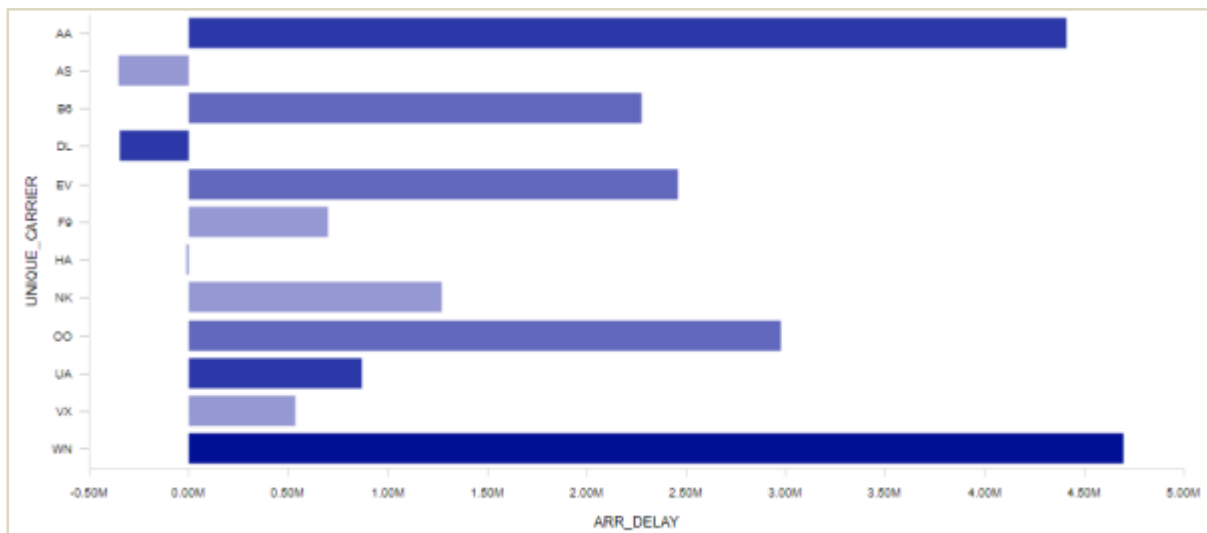
Note:

This property is not applicable for Tabular, Tree, Gauge, Chord, Sunburst, Hierarchy tree, Map, Bubble, Candlestick, and High low open close type of visualizations.

Shown below is an example of a Horizontal bar chart with 'Show legend' as enabled and disabled:



QUICK SETTINGS – SHOW LEGEND (ENABLED)



QUICK SETTINGS - SHOW LEGEND (DISABLED)

9.2.5 Enable drill down on legend

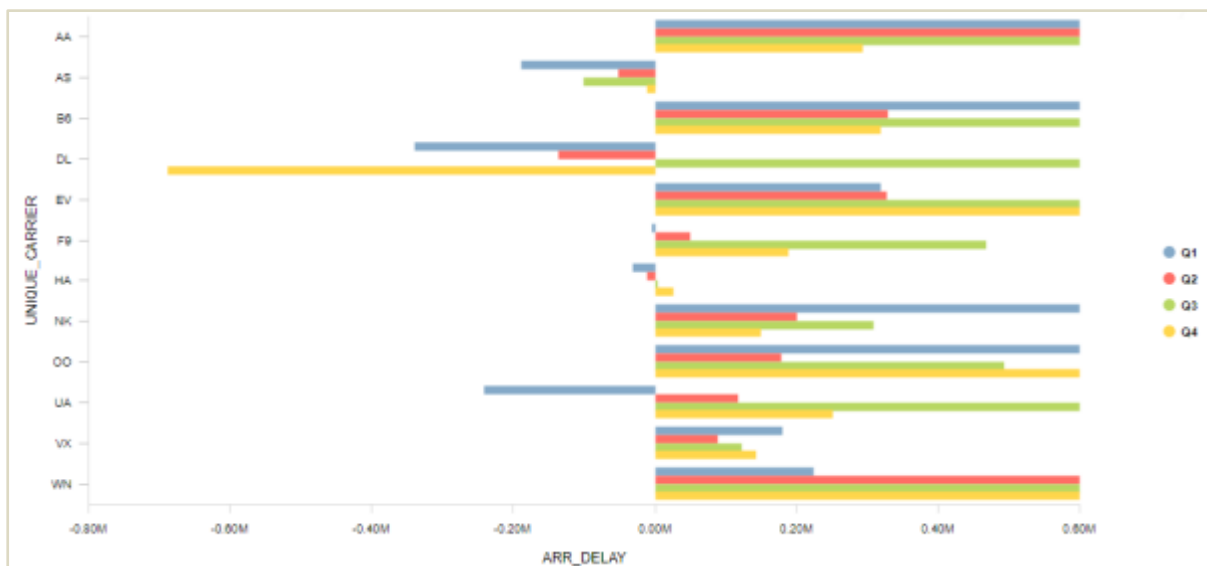
This property allows users to enable or disable drill down on legend.

Note:

This property is not applicable for Tabular, Tree, Gauge, Chord, Sunburst, Hierarchy tree, Map, Bubble, Candlestick, and High low open close type of visualizations.

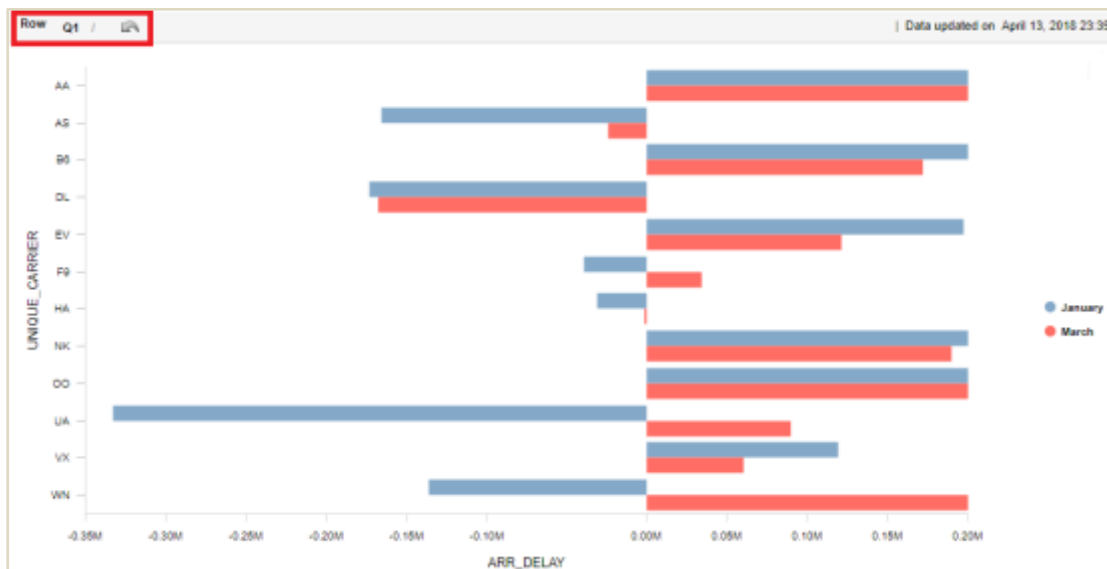
With the help of this property, users can drill down to different dimensions from the legend allowing them to access specific information.

Shown below is an example of a Horizontal bar chart showing arrival delay of each carrier for all four quarters of the year.

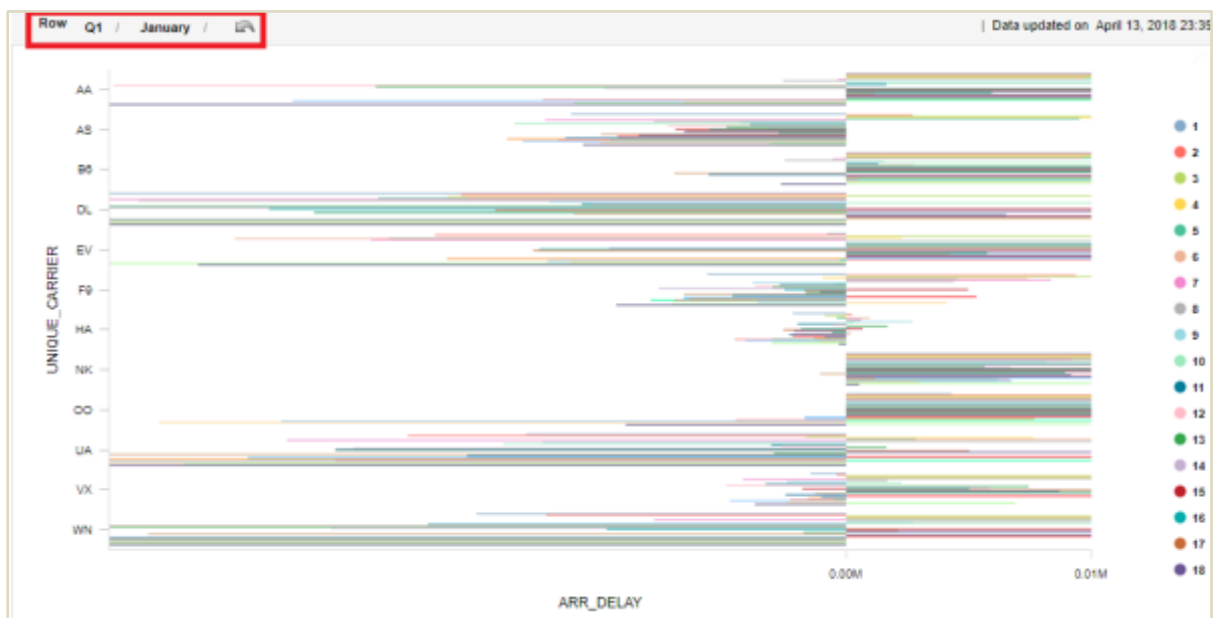


HORIZONTAL BAR CHART

When the 'Enable drill down on legend' property is enabled, users can drill down each quarter to months, which in turn can be further drilled down to each day and so on until the last dimension is reached.



QUICK SETTINGS – ENABLE DRILL DOWN ON LEGEND (ENABLED)



QUICK SETTINGS – ENABLE DRILL DOWN ON LEGEND (ENABLED)

When the 'Enable drill down on legend' property is disabled, users can not drill down from the legend. Instead, they can choose to show or hide the information related to any of the legend label, quarters in this case.

9.2.6 Hide null on category axis

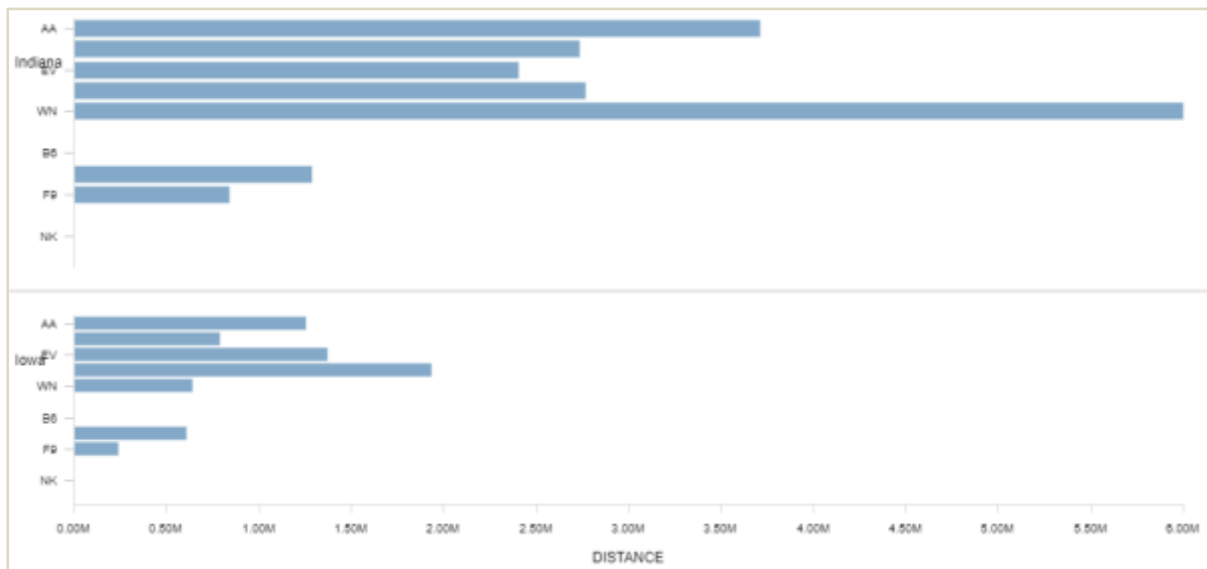
This property allows users to show or hide the values of category axis that are null.

Note:

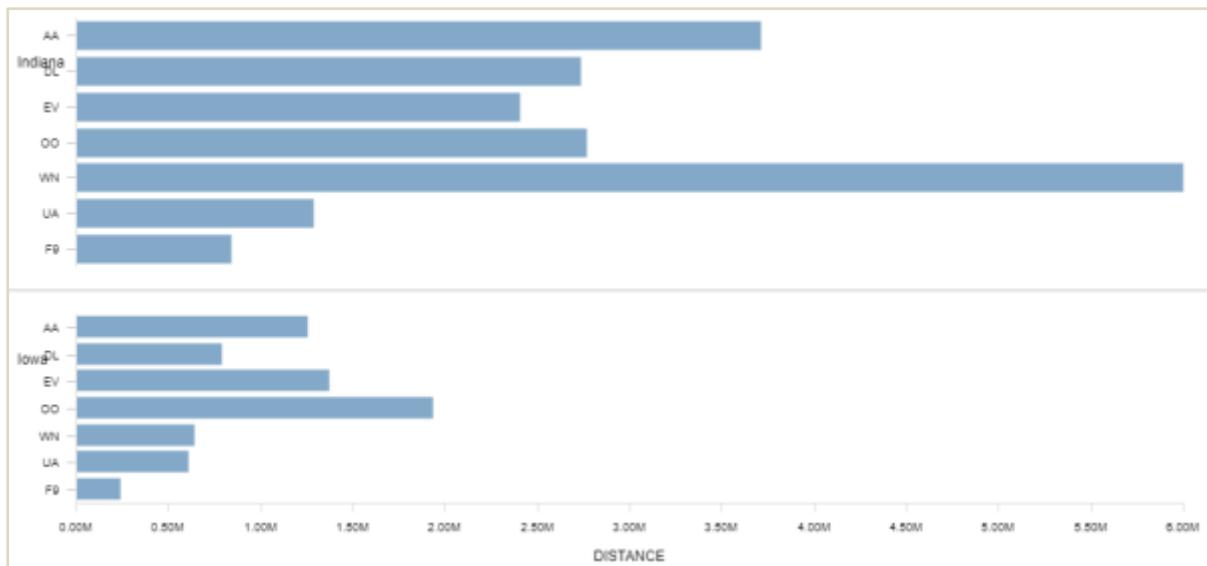
This property is not applicable for Pie chart, Radar chart, Combined chart, XY Chart, HeatMap, Histogram, Tabular, Tree, Gauge, Chord, Sunburst, Hierarchy tree, Map, Bubble, Candlestick, and High low open close type of visualizations.

For example, the flight data contains information related to distance covered by flights belonging to various carriers for various states. All carriers may not be available for all states. In such cases, the visualization will not display any information for carriers that do not belong to a state.

Shown below is an example of a Horizontal bar chart with 'Hide null on category axis' as disabled and enabled:



QUICK SETTINGS – HIDE NULL ON CATEGORY AXIS (DISABLED)



QUICK SETTINGS – HIDE NULL ON CATEGORY AXIS (ENABLED)

9.2.7 Enable pagination

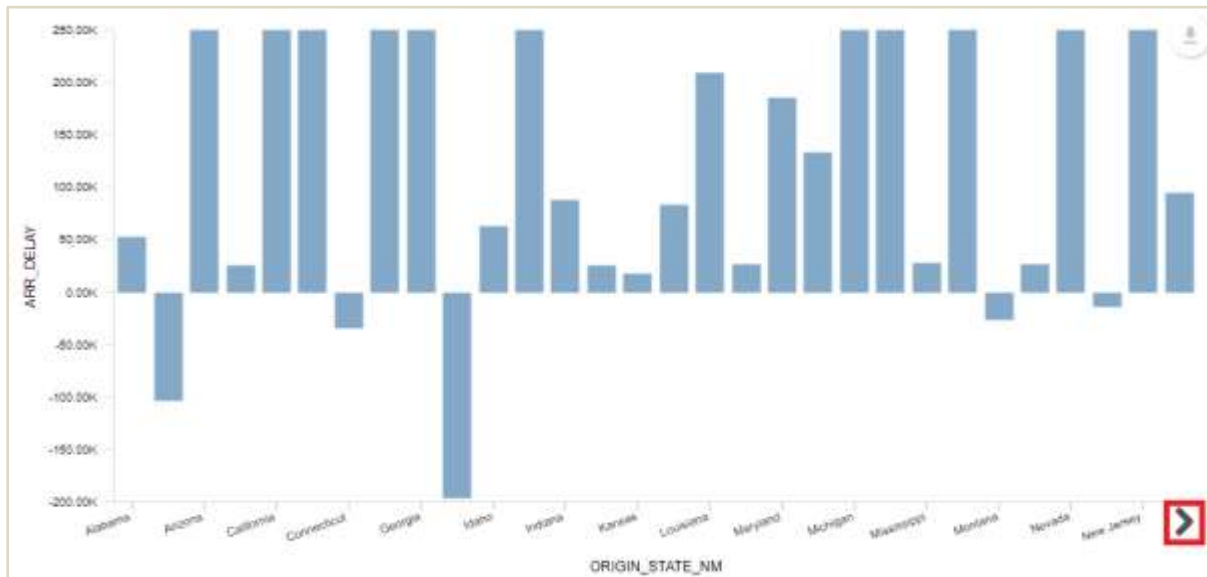
This property allows users to navigate through the multiple pages of the visualization. By default, this property is enabled.

Note:

This property is available only when there are multiple pages in the visualization.

It is not available for Pie, Radar, Candlestick, High low open close, Chord, Sunburst, Hierarchy tree, Bubble and Map type of visualizations.

Shown below is an example of a Horizontal bar chart with 'Enable pagination' enabled:



QUICK SETTINGS – ENABLE PAGINATION (ENABLED)

9.2.8 Enable sampling

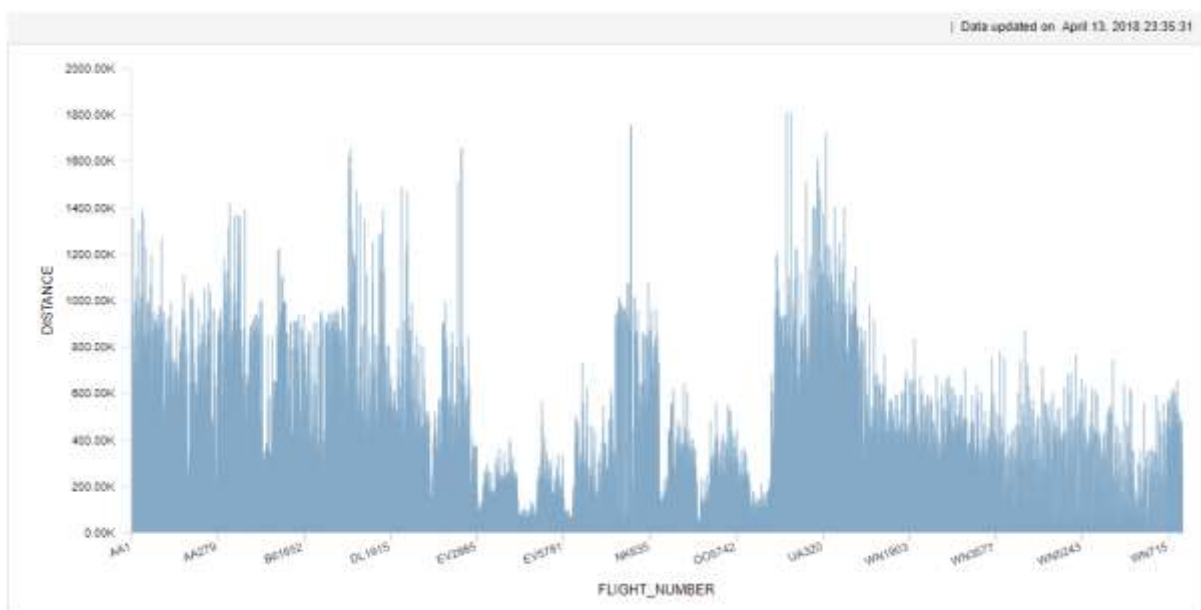
Rendering visualizations with a large amount of data takes a lot of time or sometimes visualisation loses the purpose. To overcome this, Smart Visualization provides facility to create visualization with a sample of such data instead of the whole data.

Using this property, users can choose whether or not a sample data should be considered to create visualization. This property is applied automatically for large data and visualization is displayed for the sample data with 'Enable pagination' property automatically turned on. Users can also turn this option off to generate visualization using the whole data.

Note:

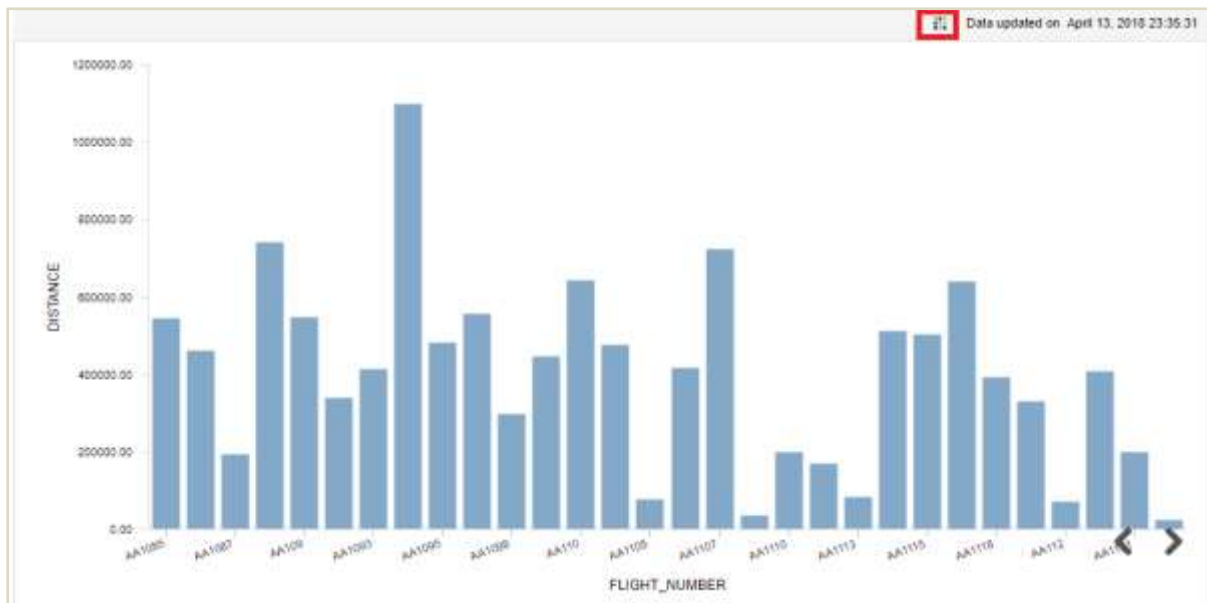
The size of the sample depends upon the size of data.

Shown below is an example of a Vertical bar chart displaying complete data containing more than 2.5 million records without any sampling applied:



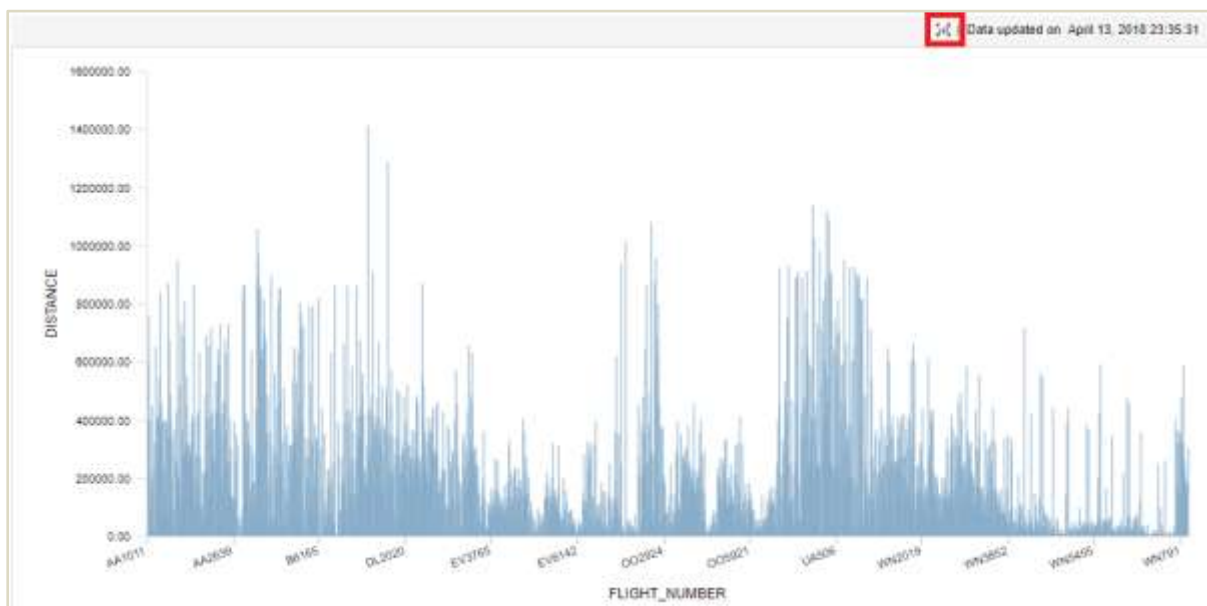
QUICK SETTINGS – ENABLE SAMPLING (DISABLED)

Shown below is an example of a Vertical bar chart with 'Enable sampling' as enabled and 'Enable pagination' as enabled for data containing more than 2.5 million records:



QUICK SETTINGS – ENABLE SAMPLING (ENABLED)

Shown below is an example of a Vertical bar chart with 'Enable sampling' as enabled and 'Enable pagination' as disabled for data containing more than 2.5 million records:



QUICK SETTINGS – ENABLE SNAPSHOT VIEW (ENABLED)

9.2.9 Enable snapshot view

This property creates snapshot visualization for a large data using sample of such a data instead of the whole data. It helps users to understand the trends by creating meaningful visualizations for large amount of data.

It is a smart feature that automatically detects large amount of data and creates a snapshot view by using the sample data from the large data. When this property is on, it automatically applies sampling as and when required to display the best possible visualization.

Users can also turn this option off to generate visualization using the whole data.

Note:

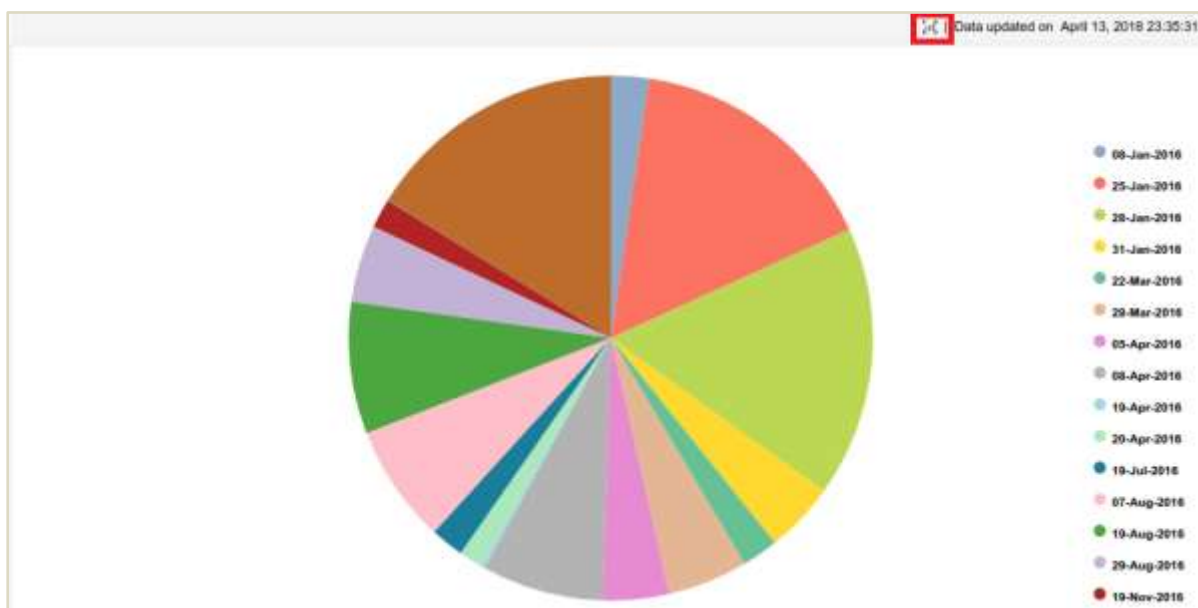
This property is not available for the Tabular type of visualization.

The size of the sample depends upon the type of visualization.

Shown below is an example of a Pie chart generated for data containing more than 2.5 million records with 'Enable snapshot view' property turned off and on:



QUICK SETTINGS – ENABLE SNAPSHOT VIEW (DISABLED)



QUICK SETTINGS – ENABLE SNAPSHOT VIEW (ENABLED)

Shown below is an example of a Hierarchy tree generated for data containing more than 2.5 million records with 'Enable snapshot view' property turned off and on:

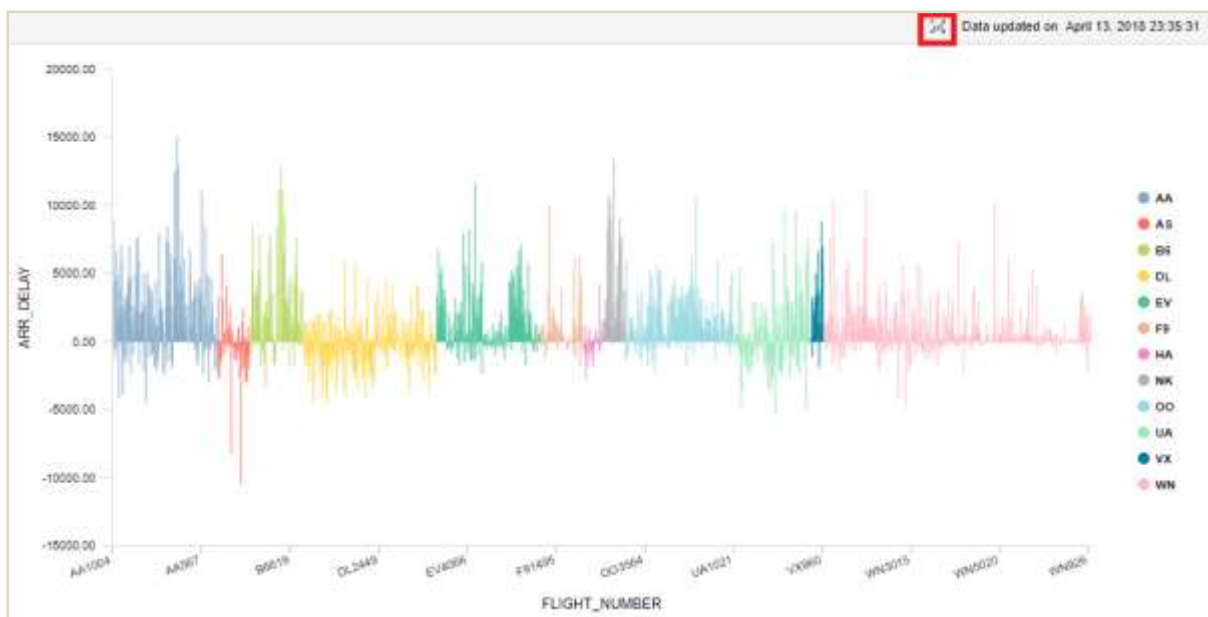
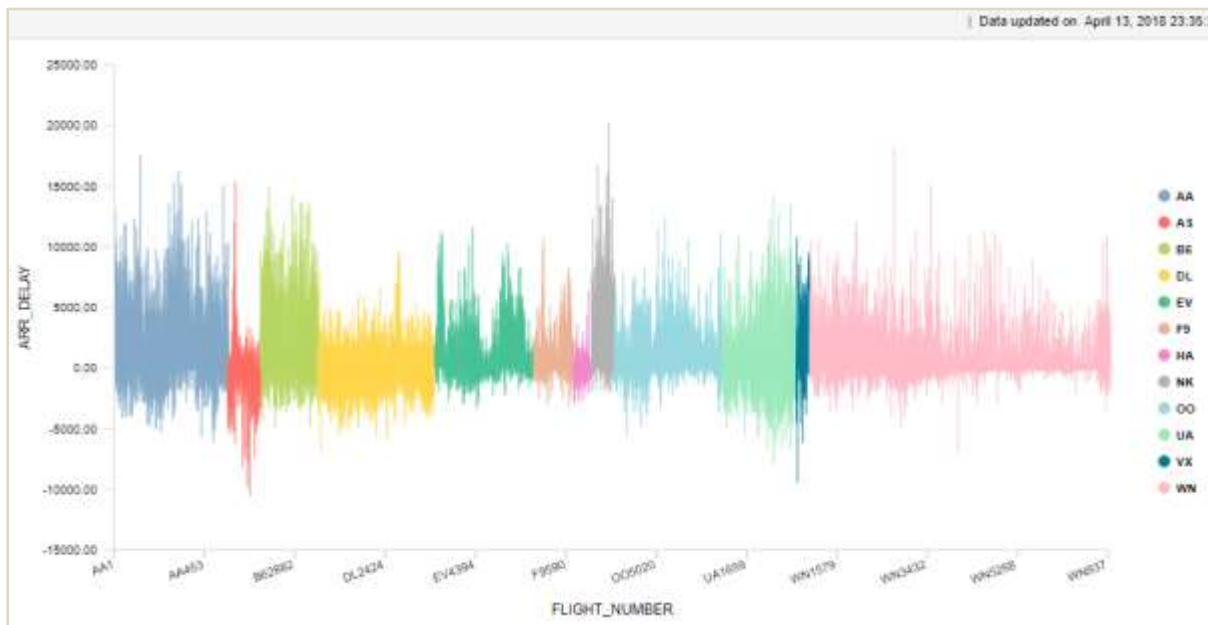


QUICK SETTINGS – ENABLE SNAPSHOT VIEW (DISABLED)



QUICK SETTINGS – ENABLE SNAPSHOT VIEW (ENABLED)

Shown below is an example of a Bar chart generated for data containing more than 2.5 million records with 'Enable snapshot view' property turned off and on:



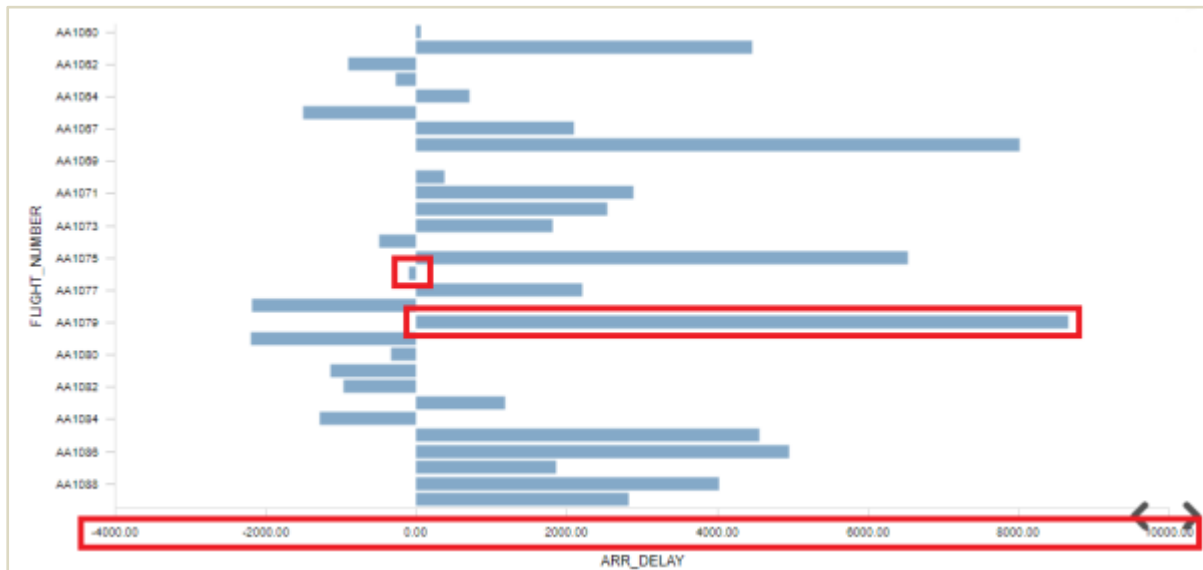
9.2.10 Enable scaling

This property allows users to enable or disable the scale of visualization. When there is a huge variation in data, and scaling is not applied, data points representing lower values are too small and those representing higher values are too big. In such a scenario, data points with disproportionate sizes affect the interpretation of the chart. When this property is on, it applies scaling on the axis values and generates meaningful visualizations by keeping the proportions aligned with the data.

Note:

This property is available only for Vertical and Horizontal bar charts, Line charts and Combined charts.

Shown below is an example of a Horizontal bar chart with 'Enable scaling' as disabled and enabled:



QUICK SETTINGS – ENABLE SCALING (DISABLED)



QUICK SETTINGS – ENABLE SCALING (ENABLED)

10 Operations on charts

Smart visualization allows users to perform various operations on the charts such as apply sampling, outliers, data operations, filters, sorting, ranking and other functions.

10.1 Data operations

Users can perform various operations on the values of charts by using an extensive collection of functions.

Following is the list of all data operations:

1.	Sum
2.	Average
3.	Effective Average
4.	Count
5.	Effective Count
6.	Maximum

7.	Minimum
8.	First
9.	Last
10.	Row Group Percentage
11.	Column Percentage
12.	Column Group Percentage
13.	Total Percentage
14.	Relative Row Difference
15.	Relative Row Difference Percentage
16.	Relative Column Group Difference
17.	Relative Column Group Difference Percentage
18.	Row Cumulative Sum
19.	Row Group Cumulative Sum
20.	Least Recent Values
21.	Most Recent Values
22.	Distinct

Please refer to the following document for more information on different data operations.

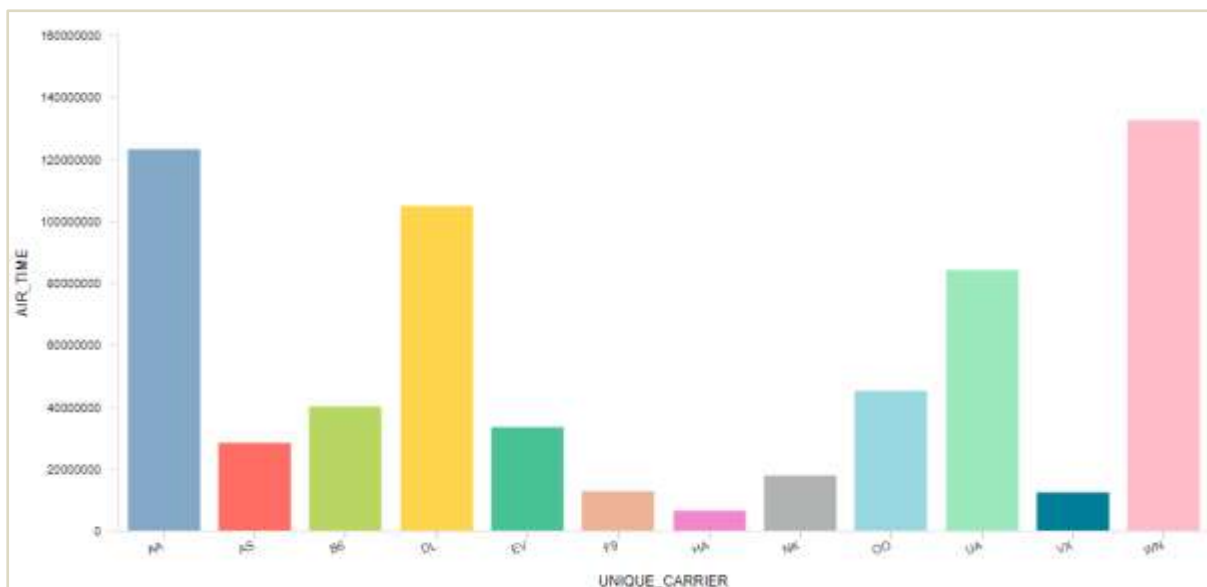
Reference: **ElegantJ BI Concept Manual > Analytic Functions > Data Operations**

10.2 Top-Bottom

This function allows users to view Dimensions that have the highest and the lowest values in a chart. Users can select the Dimension column and the Measure column based on which the top-most or the bottom-most Dimensions have to be displayed. Users can also choose the number of Dimensions that can be viewed in a chart.

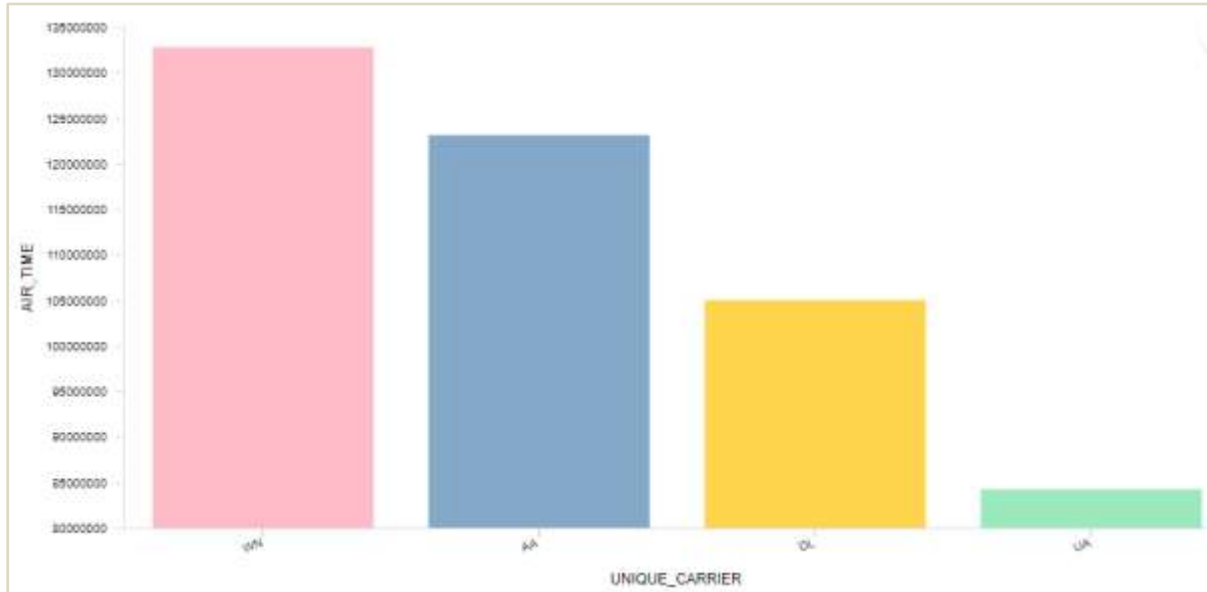
Let us consider data containing information on daily flights originating from and landing at various airports in the USA along with their Carrier (Unique_Carrier), and airtime (Air_Time).

The following Vertical bar chart displays the Air Time for each Carrier:



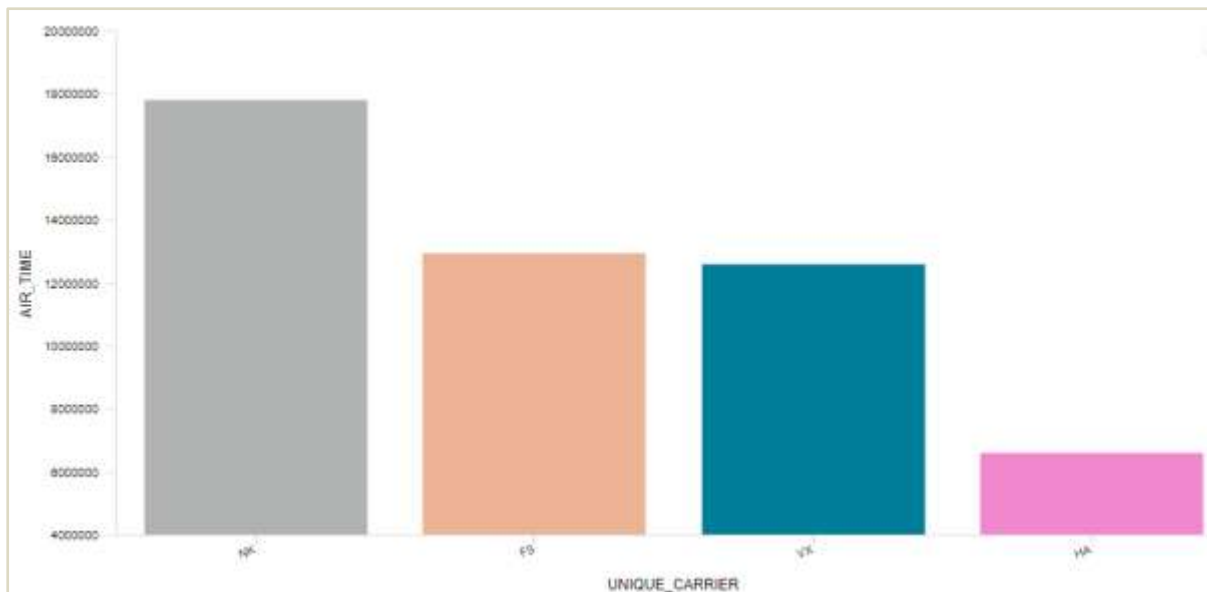
VERTICAL BAR CHART

Shown below is an example of the same Vertical bar chart with the top four Carriers having the maximum Air Time:



TOP-BOTTOM - TOP

Shown below is an example of the same Vertical bar chart with the bottom-most four Carriers having the minimum Air Time:



TOP-BOTTOM - BOTTOM

Please refer to the following document for more information on Top-Bottom.

Reference: [ElegantJ BI Concept Manual > Filters and Expressions > Rank](#)

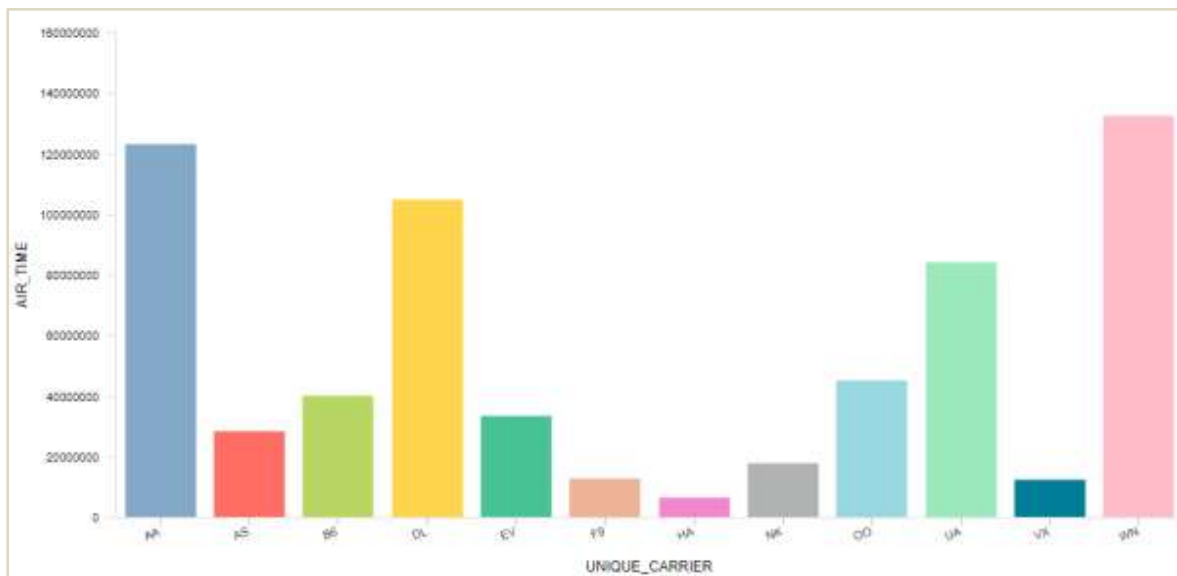
10.3 Sort

This function allows users to arrange the values of category axis in ascending or descending order.

10.3.1 Simple sort

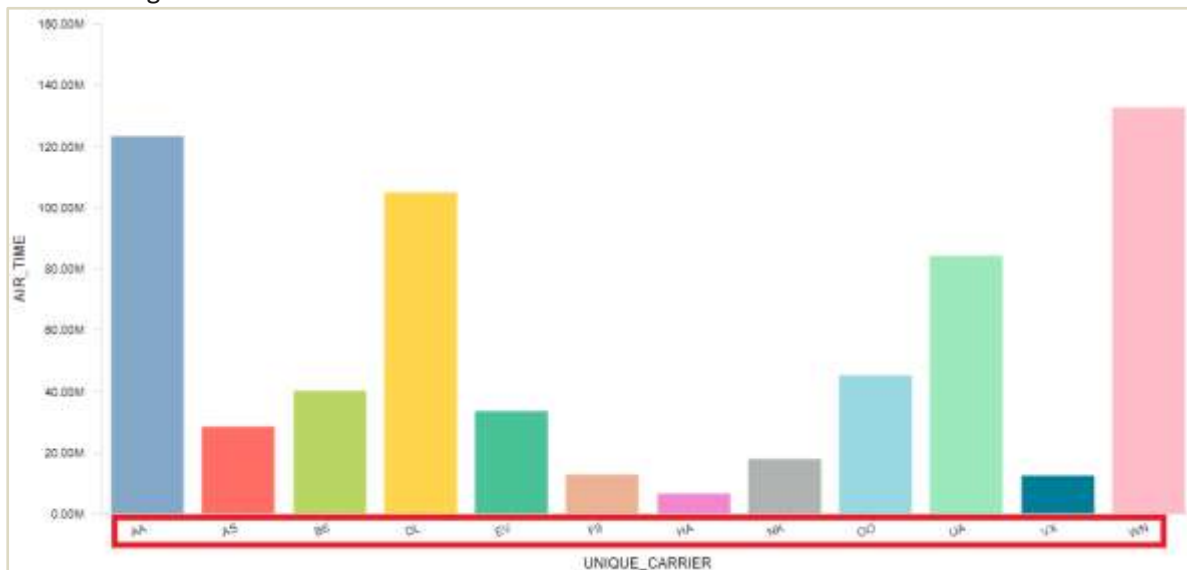
Users can arrange the values of category axis in ascending or descending order. Users can select the Dimension and sort order in which the values have to be displaced in the visualization.

The following Vertical bar chart displays the Air Time for each Carrier without any sorting applied:



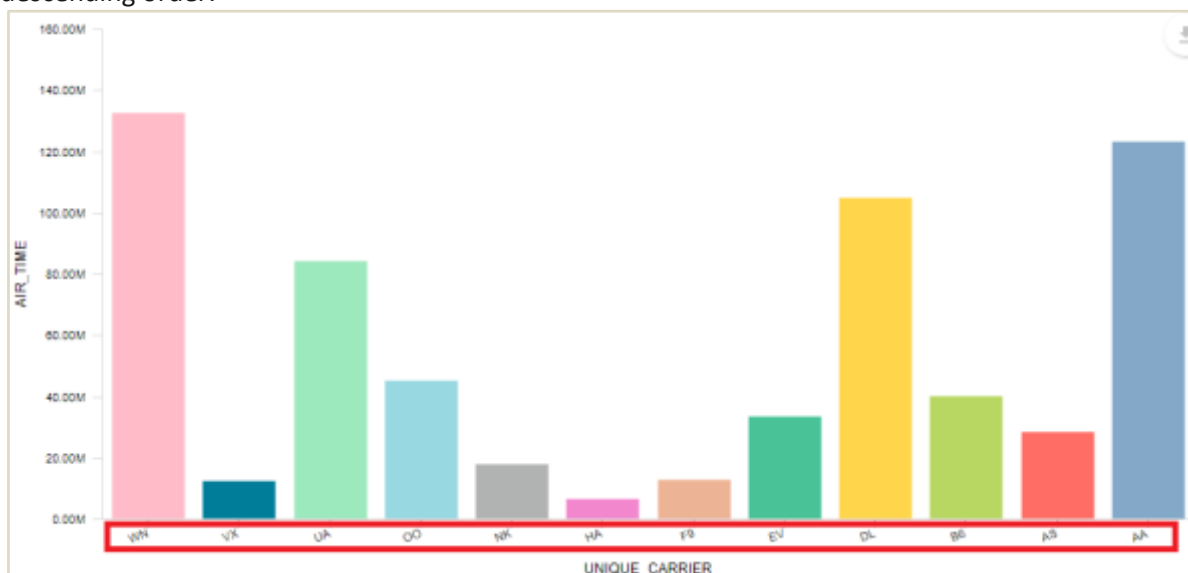
VERTICAL BAR CHART

Shown below is an example of the same Vertical bar chart with Carriers (Unique_Carrier) arranged in an ascending order:



SORT – ASCENDING

Shown below is an example of the same Vertical bar chart with Carriers (Unique_Carrier) arranged in descending order:

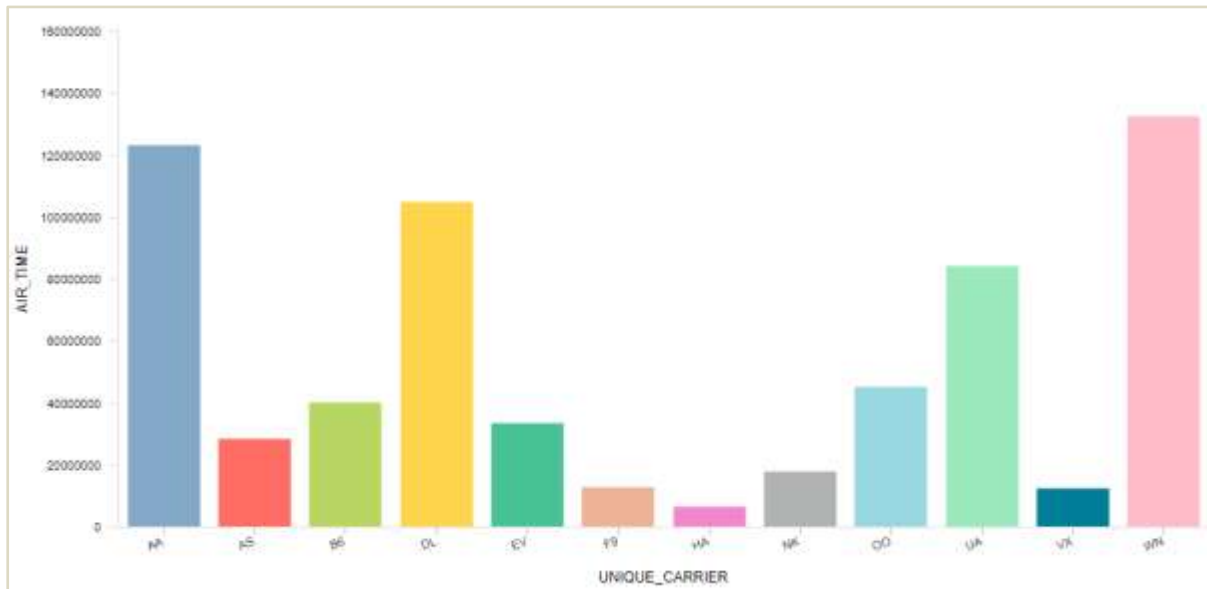


SORT – DESCENDING

10.3.2 Advance sort

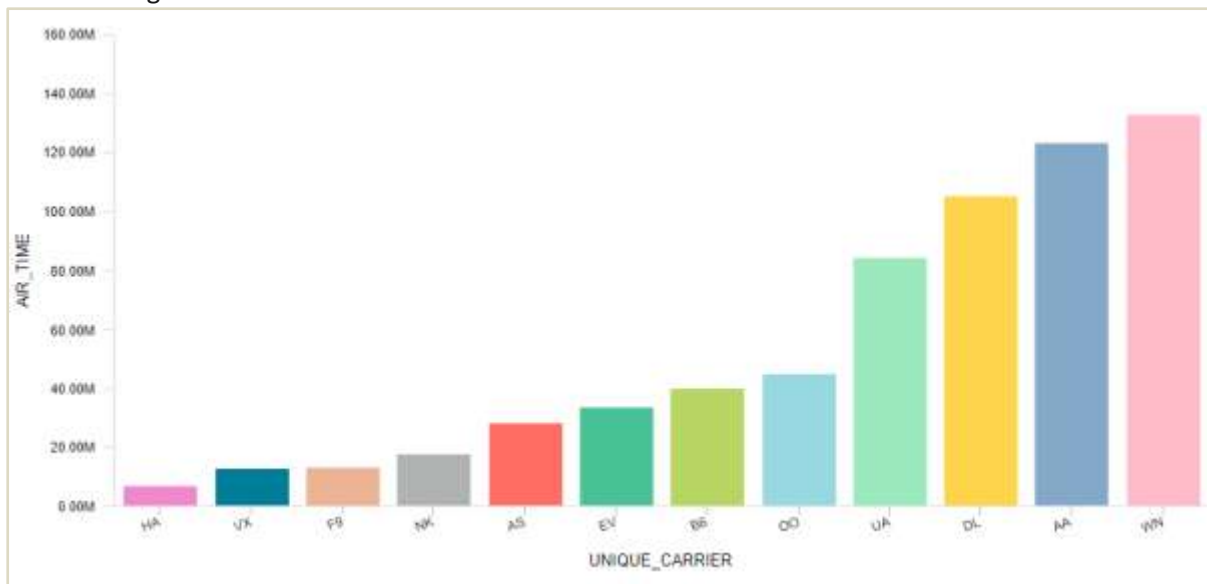
Users can arrange the values of category axis in ascending or descending order based on the values in value axis. Users can select the Dimension, sort order and the Measure column based on which the values have to be displaced in the visualization.

The following Vertical bar chart displays the Air Time for each Carrier without any sorting applied:



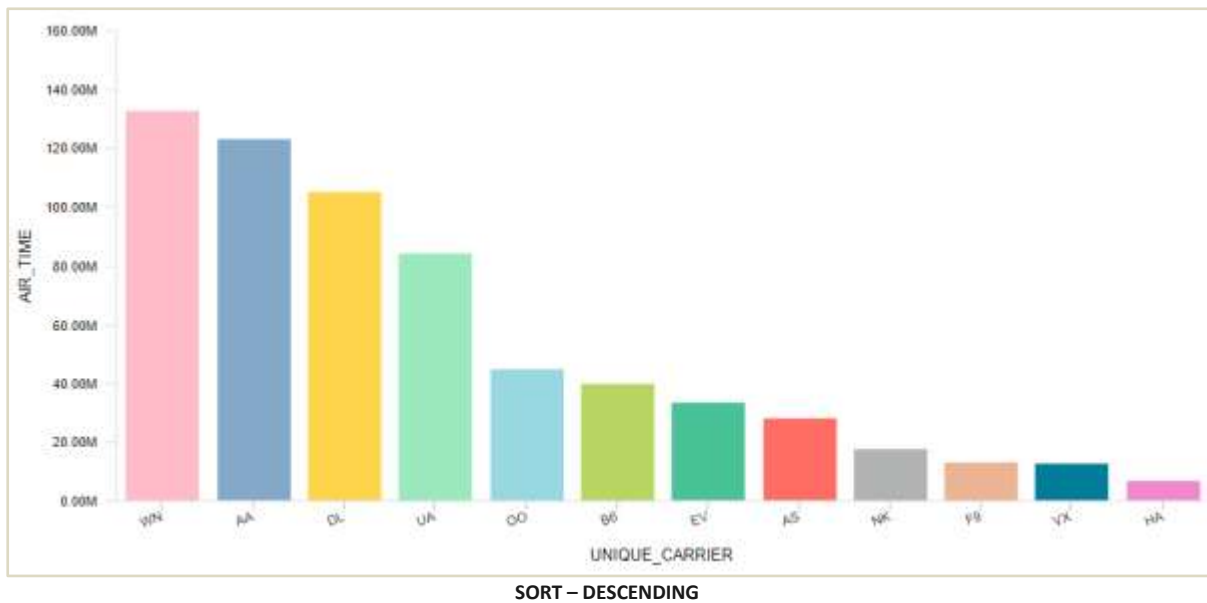
VERTICAL BAR CHART

Shown below is an example of the same Vertical bar chart with Carriers (Unique_Carrier) arranged in an ascending order of Air Time:



SORT - ASCENDING

Shown below is an example of the same Vertical bar chart with Carriers (Unique_Carrier) arranged in descending order of Air Time:



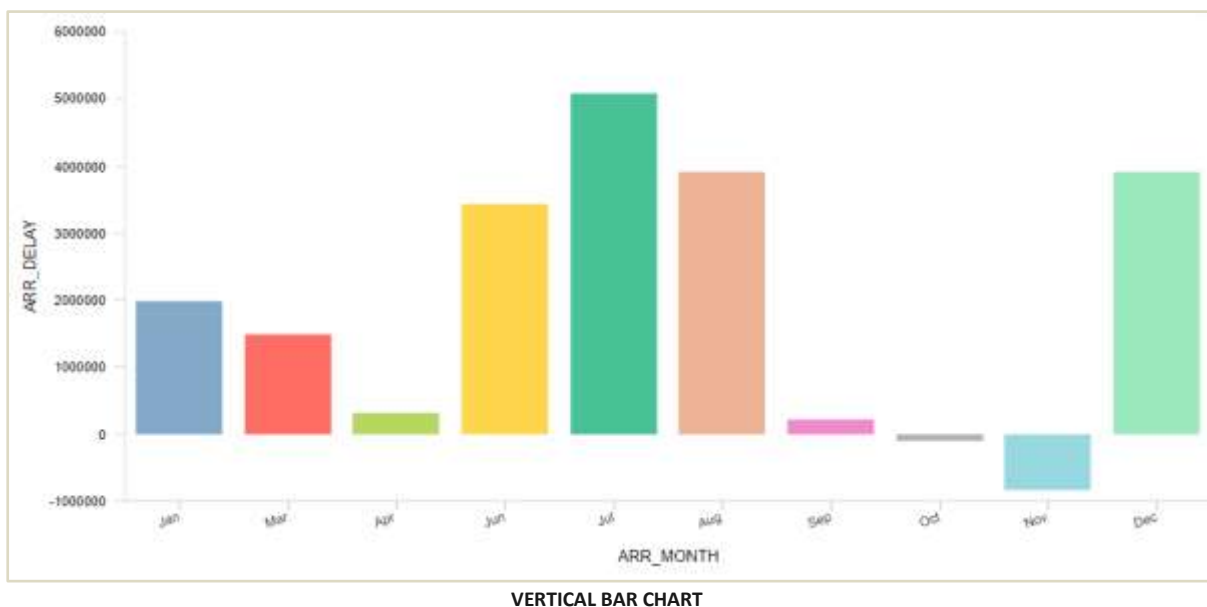
Please refer to the following document for more information on Sort.

Reference: **ElegantJ BI Concept Manual > Analytic Functions > Sort**

10.4 Group

This function allows users to merge two or more Dimension values. Users can create multiple groups for a Dimension. In case there is more than one Dimension in the visualization, users can create groups for multiple Dimensions as well.

For example, the Vertical bar chart shown below displays the Arrival Delay for each month.



The vertical bar chart shown below displays two groups namely Qtr1 and Qtr2. Qtr1 consists of values of Jan, Feb, and Mar and Qtr2 consists of values of Apr, May and Jun.



Please refer to the following document for more information on Top-Bottom.

Reference: [ElegantJ BI Concept Manual > Analytic Functions > Group & Ungroup](#)

10.5 Filters

Users can apply a variety of filters on the visualization data.

The following filters are available:

- Time Series
- Advanced Filter
- Global variables
- Retrieval parameters

Please refer to the following document for more information on filters.

Reference: [ElegantJ BI-Concept manual > Filters and Expressions > Time Series](#)

Reference: [ElegantJ BI-Concept manual > Filters and Expressions > Advanced Filter](#)

Reference: [ElegantJ BI-Concept manual > Filters and Expressions > Global Variables](#)

Reference: [ElegantJ BI-Concept manual > Filters and Expressions > Retrieval Parameters](#)

10.6 Measure buckets

Smart Visualization allows users to configure various visualization properties including color, size, and shape of the charts as per their requirement. When a user places a Measure column in the color, size or shape quadrants of the Outliner, the system automatically creates the buckets of its values. Each bucket is represented by a unique color, size and shape respectively. The buckets of values are also created when a Measure column is placed in Rows or Columns quadrant of the Outliner.

Please refer to the following document for more information.

Reference: [Smart Visualization-Concept manual > Working with Smarten Mode Off > Outliner](#)

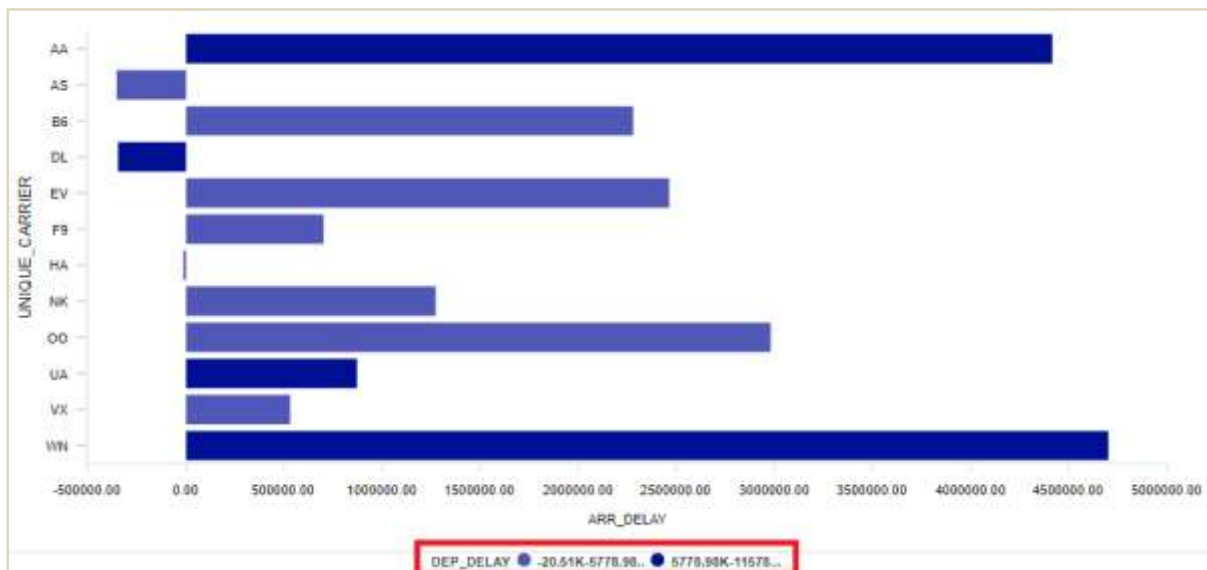
By default, the system automatically creates 4 buckets which can be changed by the users. Users can also customize the range of values for each bucket.

For example, shown below is the Horizontal bar chart with 4 buckets of “Dep_Delay” values and each bucket is represented by a unique color.



HORIZONTAL BAR CHART

shown below is the same Horizontal bar chart with 2 buckets of “Dep_Delay” values and each bucket is represented by a unique color.



HORIZONTAL BAR CHART

10.7 Sampling

Rendering visualizations with a large amount of data takes a lot of time or sometimes visualization loses the purpose. To overcome this, Smart Visualization provides facility to create visualization with a sample of such data instead of the whole data. The size of the sample depends upon the size of data.

Sampling

Sampling parameter selection

☒ Auto ☐ Manual

Select sampling method

☒ Simple random sampling ⓘ ☐ Stratified sampling ⓘ

0% sample size has been recommended and it will result in 300000 records in final sample

Change sample size

☐ 0 % OR ☒ 300000 records

OK **CANCEL**

SAMPLING

10.7.1 Sampling - Auto

The auto mode of sampling automatically applies sampling and generates visualization with a sample data instead of the whole data. It limits a particular number of records that should be considered for sample data. The size of the sample depends upon the size of data. Users cannot change this limit.

10.7.2 Sampling - Manual

The manual mode of sampling allows users to change the limit of records that should be considered for a sample. Users can also select the method of sampling.

Users can create samples by using two types of sampling methods:

- Simple random sampling
- Stratified sampling

Please refer to the following document for more information on the sampling methods.

Reference: **Self-Serve Data Preparation (SSDP) - Concept Manual >Sampling > Sampling-Simple Random Sampling**

Reference: **Self-Serve Data Preparation (SSDP) - Concept Manual >Sampling > Sampling-Stratified Sampling**

11 Consume

Users can consume the SmartenView data in various ways. They can export the SmartenView data, view it as a standalone object or embed the SmartenView object in a dashboard.

11.1 View & export SmartenView Data

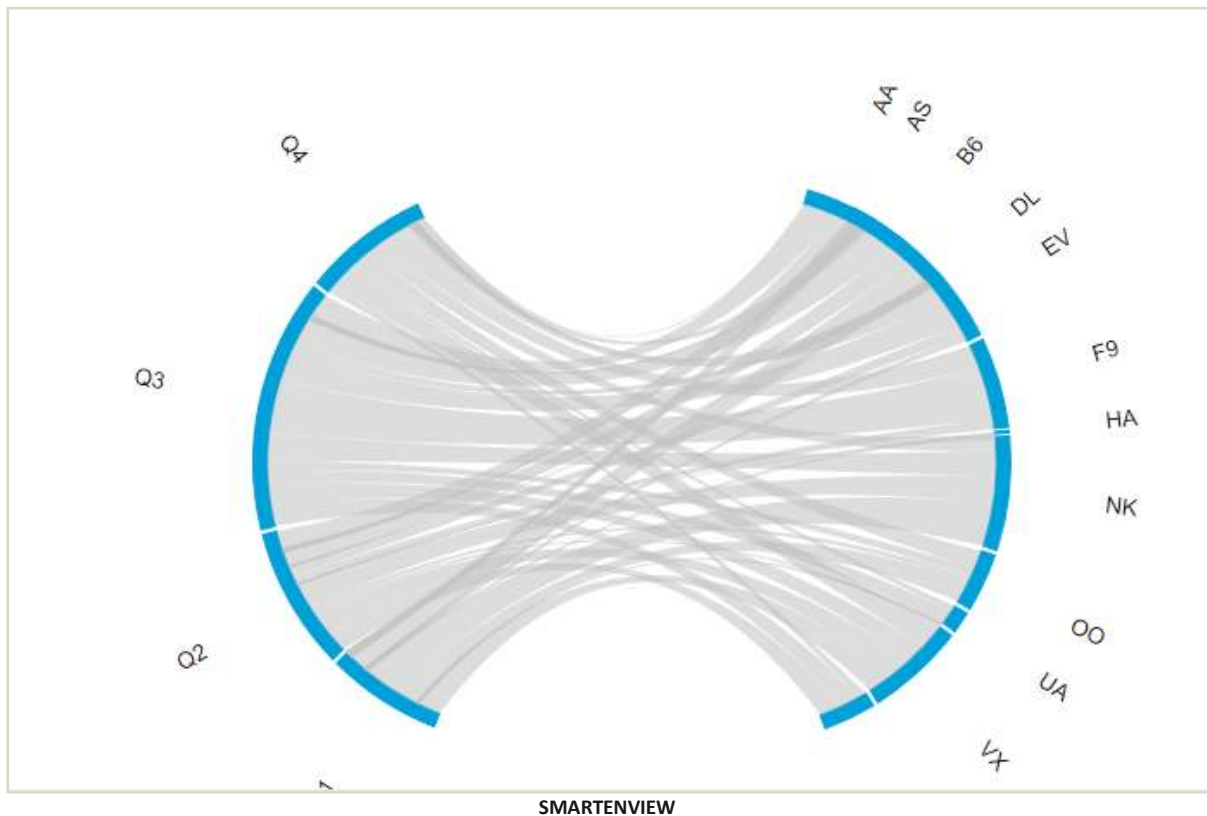
Users can export visualization data to various file formats and view them.

Following is the list of all file formats:

- JPG
- PNG
- PDF

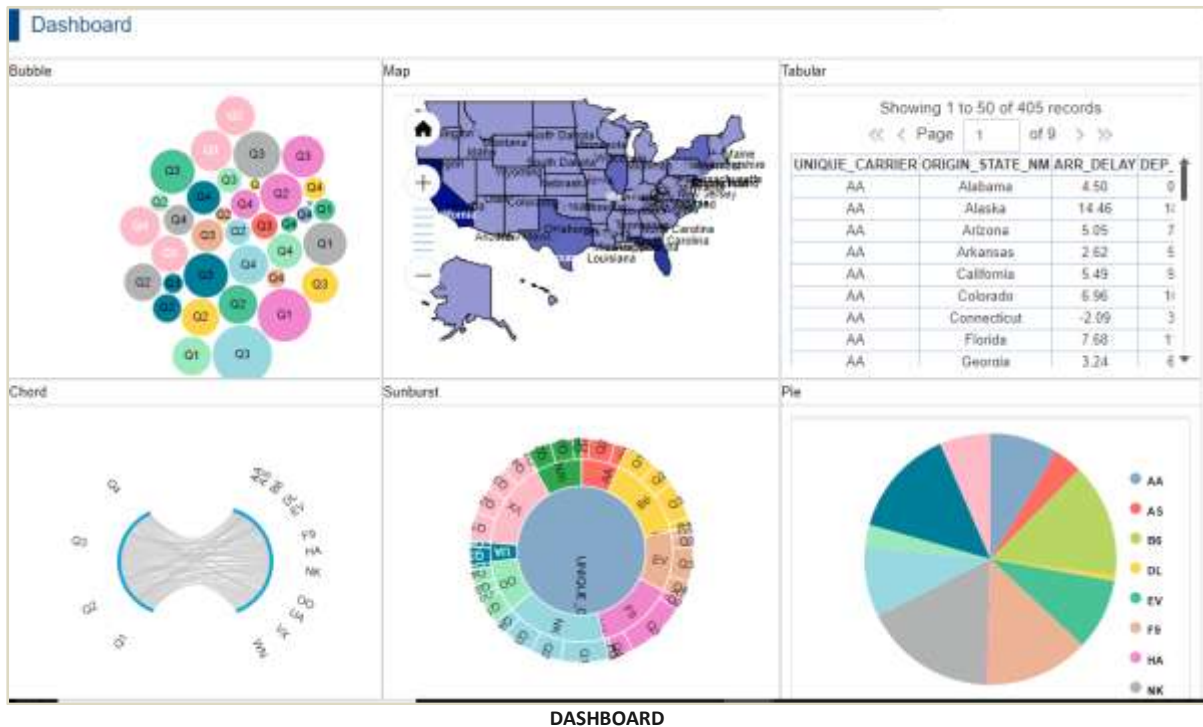
11.2 Consume as SV object

Visualizations created using Smart Visualization are called SmartenView and can be saved as an object. Like other objects, users can view the SmartenView objects as standalone objects.



11.3 Consume in dashboard

Users can embed the SmartenView objects within dashboards by adding them as components of the dashboard.



12 Product and Support Information

Find more information about ElegantJ BI-Smarten and its features at www.smartent.com

Support: support@smartent.com

Sales: sales@smartent.com

Feedback & Suggestions: support@smartent.com

Support & Knowledgebase Portal: support.smartent.com