Chart Functions

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Overview

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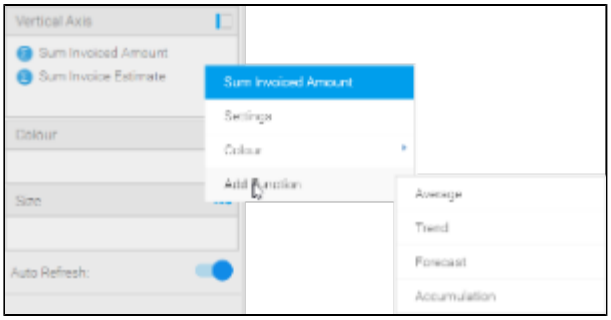
Function fields in the Chart Builder allow you to create a new field available to the chart, which is based on a report field with a selected function applied to it.

The more basic chart functions, such as Average, Trend, Forecast, and Accumulation can be applied to the advanced ones like Set Analysis or Variance.

Using Functions

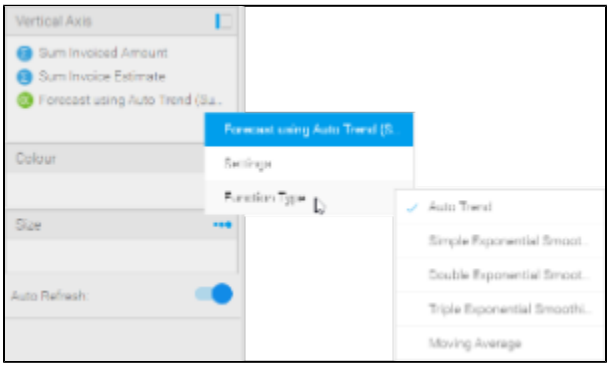
When building a chart you can add a function one of two ways:

Location	Screenshot	Description
Function List		You can drag a function from the function list on the left side of the chart builder screen. These fields will become available once required field components have been added to the chart. For example, some functions require a metric to be based on.

Field List		You can add a function directly from the field you wish to base it on: a. Hover the mouse over the field in the chart area, b. Select Add Function from the drop down list, and c. Choose the function group to be used.

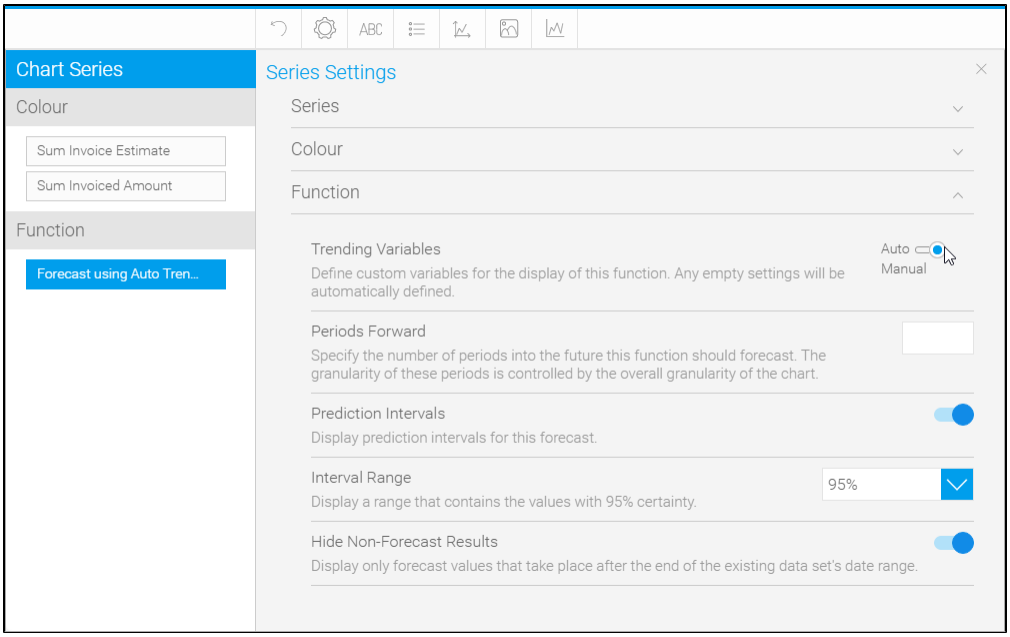
Selecting a Function

Once you have added a function to your chart, you can change the specific function being applied by clicking on the drop down menu on the field (hover the mouse over the field name).



Function Options

Once you have selected the specific function you wish to use, you can manually configure all of the parameters for it through the **Series** menu.



Average

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Mean

This displays a line calculated as the sum of all values, divided by the number of values in a dataset.

Median

This displays a line calculated by ordering all the values in ascending order and using the middle value. This can be a more useful measure than mean if the dataset has extreme outliers.

Mode

This displays a line calculated by finding the value which occurs most in the dataset.

Trend

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Auto Trend

Much like with auto charts, Yellowfin applies what it deems most useful on the particular chart based on some complex algorithms.

Option	Description
Confidence Intervals	These are used to indicate a range where unknown or missing values are likely to fall.
Interval Range (if confidence intervals used)	This specifies the certainty range of values to be displayed. ▪ **80% certainty** ▪ **90% certainty** ▪ **95% certainty** ▪ **99% certainty**

Moving Average

This displays the mean, calculated using values from a set numer of periods before each point. For example, if your dataset contains 10 periods, a moving average may be set to use 5 at a time. This can be used to follow changes in the data on a line hat is smoother than the actual values, making it useful when displaying trend for noisy (spikey) data.

Option	Description
Periods	This specifies the number of periods the moving average will cover. A higher number of periods will result in a smoother, but less responsive trend line.
Missing Values	This specifies how missing data should be treated. ▪ **Linear Interpolation**: gaps in the dataset will be treated as if they're on a line that connects the two bounding values ▪ **Treat as zero**: gaps in the dataset will be treated as zero
Confidence Intervals	These are used to indicate a range where unknown or missing values are likely to fall.
Interval Range (if confidence intervals used)	This specifies the certainty range of values to be displayed. • **80% certainty** • **90% certainty** • **95% certainty** • **99% certainty**

Linear Regression

This displays a straight line that indicates the relationship between the values on the x & y axes. This can be useful to give an idea of the general trend of data.

Option	Description
Confidence Intervals	These are used to indicate a range where unknown or missing values are likely to fall.
Interval Range (if confidence intervals used)	This specifies the certainty range of values to be displayed. • **80% certainty** • **90% certainty** • **95% certainty** • **99% certainty**

Polynomial Regression

This displays a curved line to the dataset which indicates the relationship between the values on the x & y axes. This can be used where the relationship between the values is not completely linear, for example if your trend has significant fluctuations through it.

Option	Description
Order	This specifies how many terms will make up the polynomial for the functions. The higher the degree, the more tightly fitted the regression line.
Confidence Intervals	These are used to indicate a range where unknown or missing values are likely to fall.
Interval Range (if confidence intervals used)	This specifies the certainty range of values to be displayed. • **80% certainty** • **90% certainty** • **95% certainty** • **99% certainty**

Forecast

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Auto Trend

Much like with auto charts, Yellowfin applies what it deems most useful on the particular chart based on some complex algorithms.

Option	Description
Periods Forward	This specifies the number of periods into the future this function should forecast. The granularity of these periods is controlled by the overall granularity of the chart.
Prediction Intervals	These are used to indicate a range where the actual value is likely to fall.
Interval Range (if prediction intervals used)	This specifies the certainty range of values to be displayed. • **80% certainty** • **90% certainty** • **95% certainty** • **99% certainty**
Hide Non-Forecast Results	This specifies if forecast should be dispalyed either for the whole dataset range OR only after the end of the dataset range.

Simple Exponential Smoothing

This displays a forecast based on the average of previous values in the dataset, with weighting defined by alpha (recent vs. historic data). This is useful or forecasting data which has no general trend or seasonality.

Option	Description
Alpha	This specifies how much weight is given to recent data vs. older data. This higher the alpha value, the more weight is given to recent data.
Periods Forward	This specifies the number of periods into the future this function should forecast. The granularity of these periods is controlled by the overall granularity of the chart.
Missing Values	This specifies how missing data should be treated.
Prediction Intervals	These are used to indicate a range where the actual value is likely to fall.
Interval Range (if prediction intervals used)	This specifies the certainty range of values to be displayed. • **80% certainty** • **90% certainty** • **95% certainty** • **99% certainty**
Hide Non-Forecast Results	This specifies if forecast should be dispalyed either for the whole dataset range OR only after the end of the dataset range.

Double Exponential Smoothing

This displays a forecast based on the average of previous values in the dataset, with weighting defined by alpha (recent vs. historic data) and beta (trend). This is useful for forecasting data which has a general trend, but no seasonality.

Option	Description
Alpha	This specifies how much weight is given to recent data vs. older data. This higher the alpha value, the more weight is given to recent data.
Beta	This specifies how much weight is given to the trend of the data. The higher the beta value, the more weight is given to the data's trend.
Periods Forward	This specifies the number of periods into the future this function should forecast. The granularity of these periods is controlled by the overall granularity of the chart.
Missing Values	This specifies how missing data should be treated.
Prediction Intervals	These are used to indicate a range where the actual value is likely to fall.
Interval Range (if prediction intervals used)	This specifies the certainty range of values to be displayed. • **80% certainty** • **90% certainty** • **95% certainty** • **99% certainty**
Hide Non-Forecast Results	This specifies if forecast should be dispalyed either for the whole dataset range OR only after the end of the dataset range.

Triple Exponential Smoothing

This displays a forecast based on the average of previous values in the dataset, with weighting defined by alpha (recent vs. historic data), beta (trend), and gamma (seasonality). This is useful for forecasting data which has a general trend and varies seasonally. Triple exponential smoothing requires at least two years of data for its seasonality calculations.

Option	Description
Alpha	This specifies how much weight is given to recent data vs. older data. This higher the alpha value, the more weight is given to recent data.
Beta	This specifies how much weight is given to the trend of the data. The higher the beta value, the more weight is given to the data's trend.
Gamma	This specifies how much weight is given to the seasonality (what happened in corresponding periods of previous years). The higher the gamma, the more weight is given to the data's seasonality.

Periods Forward	This specifies the number of periods into the future this function should forecast. The granularity of these periods is controlled by the overall granularity of the chart.
Missing Values	This specifies how missing data should be treated.
Prediction Intervals	These are used to indicate a range where the actual value is likely to fall.
Interval Range (if prediction intervals used)	This specifies the certainty range of values to be displayed. • **80% certainty** • **90% certainty** • **95% certainty** • **99% certainty**
Hide Non-Forecast Results	This specifies if forecast should be dispalyed either for the whole dataset range OR only after the end of the dataset range.

Moving Average

This displays the mean, calculated using values from a set number of periods before each point. For example, if your dataset contains 10 periods, a moving average may be set to use 5 at a time. This can be used to follow changes in the data on a line that is smoother than the actual values, making it useful when displaying trend for noisy (spikey) data.

Option	Description
Periods	This specifies the number of periods the moving average will cover. A higher number of periods will result in a smoother, but less responsive trend line.
Periods Forward	This specifies the number of periods into the future this function should forecast. The granularity of these periods is controlled by the overall granularity of the chart.
Missing Values	This specifies how missing data should be treated.
Prediction Intervals	These are used to indicate a range where the actual value is likely to fall.
Interval Range (if prediction intervals used)	This specifies the certainty range of values to be displayed. • **80% certainty** • **90% certainty** • **95% certainty** • **99% certainty**
Hide Non-Forecast Results	This specifies if forecast should be dispalyed either for the whole dataset range **OR** only after the end of the dataset range.

Accumulation

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This displays an accumulative % of total line on the chart, using a secondary axis.

Set Analysis

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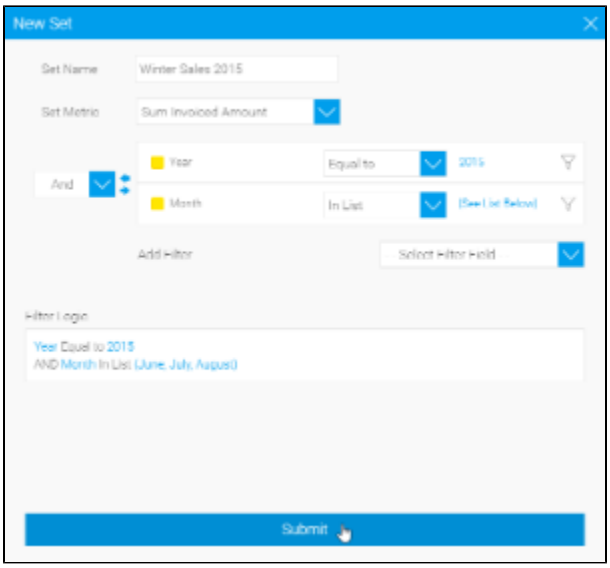
This allows you to display a subset of the data contained within a specified field.

In order to define a Set Analysis field you will:

1. Select a report metric field to base the results on,
2. Specify a range of filters that will be applied solely to this field within the chart



Option	Description
Set Name	This specifies the display name of the resulting set analysis field, used in the chart labels and/or legend.
Set Metric	This allows you to select the field to filter down to your specified set. Only metric fields included in your report will be available in this list.
Filter	This allows you to specify the filters to be applied to your set field. Only category fields included in your report will be available in this list. *See Filter Settings for more information on how to define filter logic.*

Note: Set Analysis filtering happens **after** the report results are returned from the database. This means that set analysis filters **do not appear** within the report SQL, and as such will be applied **after** user prompt filters.

Learn how to perform a Set Analysis function here.

Variance

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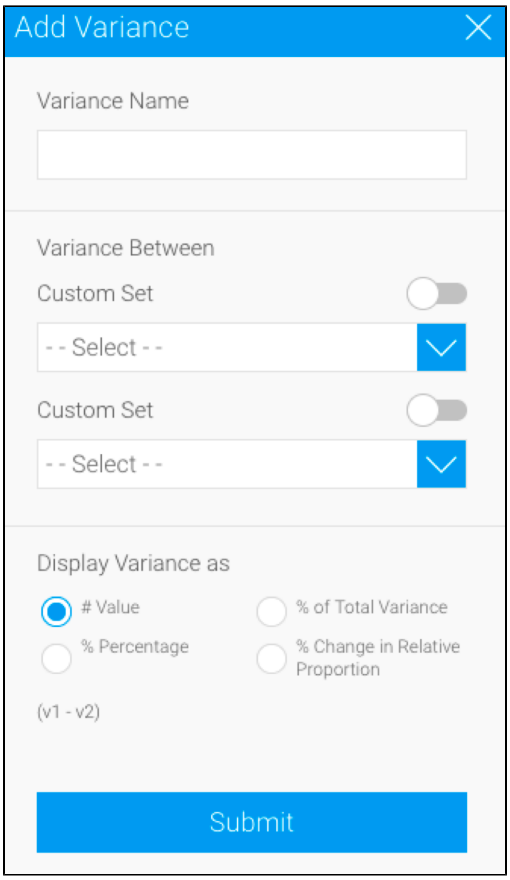
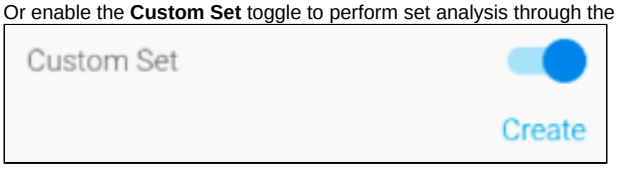
This displays the difference between two fields from either the table or chart. The variance can be displayed as either the calculated value, or a % difference.



Option	Description
Variance Name	This specifies the display name of the resulting variance field, used in the chart labels and/or legend.
Variance Between	This allows you to select two fields or data sets to apply the variance calculation to. The values in the second field will be subtracted from the values in the first field, as part of the calculation, so **order is important**. These are the types of field available to be used as part of a variance (selected through the drop-down): 1. **Chart Fields** - all standard fields used in a chart will be available, as well as: a. **Chart Aggregated** fields - this means you could calculate the variance between the chart aggregated field and it's original report field. b. **Set Analysis** fields - this means that you can calculate the variance between two sets that have already been created. 2. **Report Fields** - all metrics included in your table. This means that you don't necessarily have to use a metric in your chart to include it in the variance calculation. Or enable the **Custom Set** toggle to perform set analysis through the Create button. 
Display Variance as	This allows you to select how the resulting variance values are displayed. There are four options: 1. **# Value** - This will display the result of subtracting field one from field two, as a number. 2. **% Percentage** - This will display the result of subtracting field one from field two, divided by value one (a percentage result). 3. **% of Total Variance** - This calculates the percentage of the total variance. (The total variance is either set on the report/chart field or is the default sum.) 4. **% Change in Relative Proportion** - Use this formula to calculate the percentage change in relative proportion. That is, the percentage of the total second value is subtracted from the percentage of the total first value, and this amount is divided by the percentage of the total second value. (The total is either set on the values, or is the default sum.)

Learn how to use a Variance function here.

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