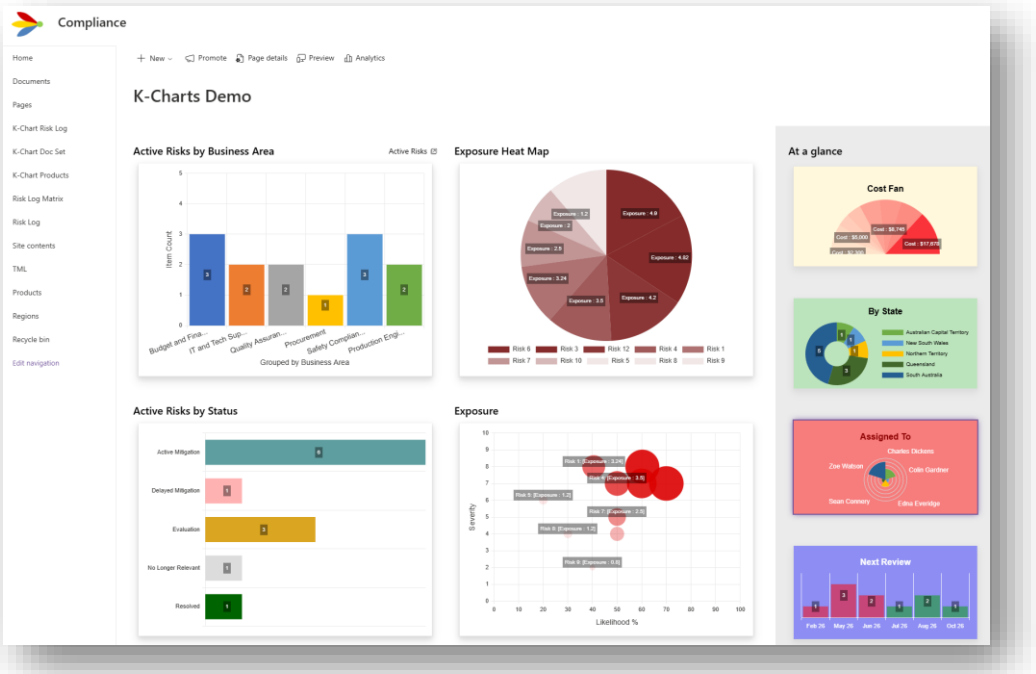
Kaboodle K-Charts

for

SharePoint Online

Simple BI for Everyone

Installation and User Guide



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Introduction

SharePoint has always been a great platform to present Business Intelligence (BI) information and historically there have been many ways in which to do so. However, with Modern UX the standard options are effectively limited to:

- **Power BI**: A truly awesome piece of software engineering but which comes with an equally impressive price tag and a level of complexity beyond the comfort zone of most users.
- **Quick Chart Web Part**: A quick and easy way to add simple data visualisations to a Modern SharePoint Site Page but woefully inadequate for anything more.

Microsoft offer us solutions at either end of the spectrum but nothing in-between.

We believe that many organisations would benefits for a light-weight BI solution built using modern technologies to deliver highly configurable, responsive and engaging data visualisations at a very affordable price point. So that's why we built K-Charts.

Note that all K-Chart visualisations are based on SharePoint lists or document libraries as data sources. This might seem a limitation, but it means that K-Charts is something that end users can cope with as there is no need to train people how to use a specialist data modelling tool or design studio. The data sources (views on lists and libraries) do not need to be in the same site as the K-Chart web parts

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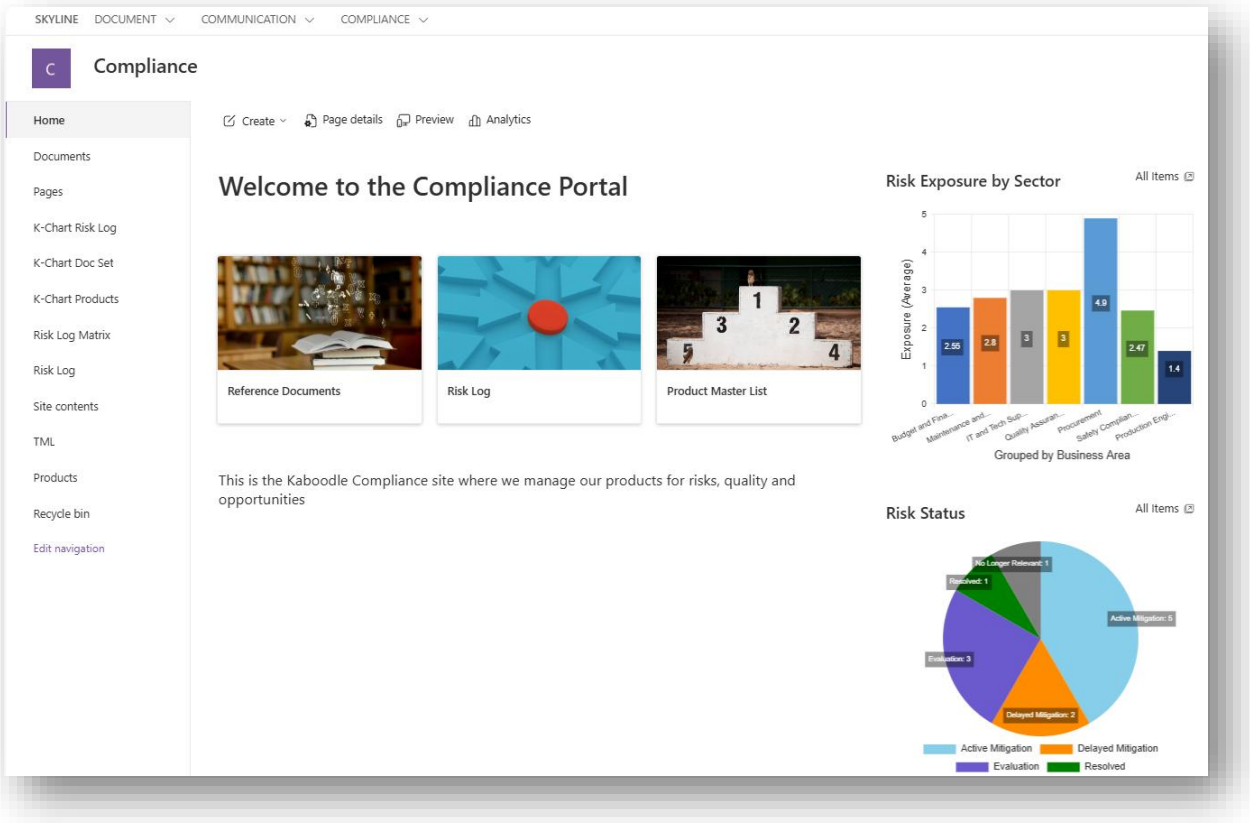
If you need to fuse and combine data sources and report on complex data structures, then K-Charts is probably not the right tool for the job and there are plenty of other (expensive and complex) offerings out there which will likely serve your needs better. But if you want quick, simple, elegant, clear, engaging and responsive data visualisations that can be added to a page in under a minute, then K-Charts is our offering to add real business benefit to your organisation with minimal cost and effort.

What is K-Charts?

K-Charts is a self-contained web part that connects with a view in a SharePoint list or document library and can render data visualisations (charts and graphs), based on list content. It is built using the SharePoint Framework (SPFx) with Office Fabric React controls, the PnP JS library and Chart.js.

K-Chart web parts can be added to any modern site page in SharePoint Online. These web parts might be used to construct a complete dashboard application page or simply to add some dynamic status information to a site homepage as shown below.



So why use K-Charts?

Listed below are what we believe to be K-Charts unique selling points:

- **Affordability**: K-Charts is a freemium product meaning that you can download it and use it for free – you don't even need to register! You only need to purchase a license if you decided to access enhanced features and capabilities.
- **Ease of Use**: Configuring K-Charts well within the skillset of your SharePoint users. In fact, we reckon most users won't need to read this manual as they will figure it out for themselves with just a little trial and error.
- **Functionality**: Just because K-Charts is easy to use, does not mean that it is lacking in functionality. There are 9 different chart types to choose from, and you have an amazing array of customisations at your disposal to create that perfect visualisation.
- **Smart Defaults**: Because the web part knows which list, view, and columns you are using, K-Charts can automatically generate default tooltips and labels for all chart elements and set up scales based on the data returned from SharePoint. You can of course always override the defaults with custom settings.
- **Integrated Data Access**: Unlike other products, K-Charts allows you to access list item data directly from the charts, without the need to go hunting in the source data lists.
- **Group, Filter, Sort and Color**: Although an initial filter and sort is provided by the selected list view, the data can then be refined to construct a custom visualisation based on the exact data you need. Chart items can also be grouped and assigned colors according to your business logic.
- **Data Columns**: K-Charts supports nearly every type of column as a data source including calculated columns, look-ups, user/group, date/time, yes/no, choice and managed metadata. And get this, it even supports columns that have been configured to accept multiple values.

- **Data Aggregation**: When chart data is grouped, it is possible to aggregate numeric data from items in the group. For example, if a list is used to track expenses you might want to use the Sum aggregation function which simply calculates the total cost of items, whereas a list used to capture user feedback might be better supported using the Average (Mean) aggregation function. There are 10 aggregations functions to choose from.
- **Document Set Support**: When connecting a K-Chart to a document library configured to use Document Sets you can choose to base the chart on either the document sets or the documents within them.
- **Content Type Support**: K-Charts can group and sort data based on Content Types.
- **Truly Engaging**: K-Charts is built using the latest client-side technologies which means that the visualisations are slick and professional looking with configurable animation settings which delivers the experience that your users will expect from a modern software solution.
- **Responsive Design**: K-Charts is built using a Responsive Design architecture which means that charts will adapt dynamically to fit the available screen real estate. These make K-Charts as easy to use on a smart phone or tablet as it is on a laptop or desktop.

Getting Started

K-Charts is simple to use because it requires no modelling tools and absolutely no code (not even JSON). You can create a stunning visualisation in less than a minute, we kid you not!

The quick steps are:

- Add a K-Chart web part to a page.
- From the web part configuration pane, select a SharePoint list or library and a view to retrieve the items of interest.
- Then select an appropriate chart type (Pie, Bar, Bubble etc.) – there are 9 to choose from.
- Chose the list columns used to group items and provide chart data.
- Optionally, apply any custom formatting options and you're done.

K-Charts is simple BI for everyone!

Key Features

Easy to use as it is, K-Charts is not light on features and options and to get the best from our products we provide this document as a detailed user and administration guide.

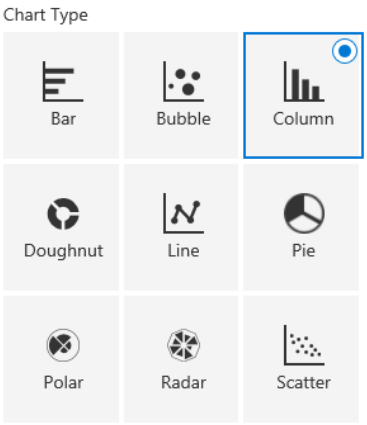
The following table provides a summary list of the key features and capabilities offered in this version of K-Charts.

Feature	Key Points	Notes
Data Sources	Any SharePoint list or document library	The only restriction is that the source data must reside in the same M365 tenancy from which the visualisation web parts are being accessed.
Supported Environments	SharePoint Online	This version of K-Charts does not support on-prem implementations of SharePoint.
Cross Site Access	K-Charts can be hooked up with any list or document library in any site in your tenancy.	A K-Chart web part will initially list all the lists and libraries in the same site, but you can select any other site in your tenancy.
Data Access	K-Charts fully respects SharePoint access control settings on the data source list	Generally, care must be taken to ensure that users have at least read-level access to the data source on which the data visualisations are based. However, as all data resides in SharePoint lists and libraries, K-Charts will fully respect all access control settings applied to the data source.[1]
View Driven	A data source is defined not just by a list but also by a specific view on that list.	The idea is that standard SharePoint list views can be used to provide an initial sort and filter of the source data. So, for example, if a K-Chart web part instance were hooked up to says an Issues Log, in which a view has been set up to show 'Active' issues, just the items returned by that view will be used for the chart data.
Driven by SharePoint Column Data	Columns on the source list are used to group and aggregate data to generate meaningful visualisations.	This usually means that the data source list will be furnished with one or more numeric columns. However, item-count information (such as how many items are assigned to a category or a particular status value or use a specific Content Type) can also be used. Visualisations can also be driven by date columns. All SharePoint list items and documents come with a Created and Modified date value as standard, but this is often augmented with additional date values such as a "Next Review" date.

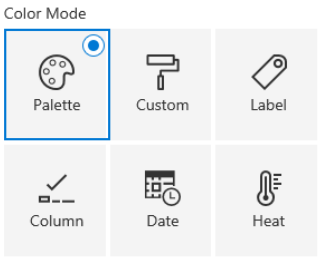
[1] Please be aware that generating data visualisations based on lists which have item level security will result in a personalised view which may not be consistent with what other users are seeing. This is of course standard SharePoint behaviour.

Feature	Key Points	Notes
Driven by Data Grouping	Data can be grouped by most column types which may be defined on the source list.	Specifically, items can be grouped by values of the following column types: — Single Line Text — Date and Time — User — Yes/No — Lookup — Choice — Managed Metadata — Content Type — Approval Status[2]
Support for Multi-Value Columns	K-Charts provides support to group data by columns that support multiple values, specifically: — Multi-Value Choice — Multi-Value Lookup — Multi-Value User — Multi-Value Managed Metadata	When a multi-value column is used to group data, there is an option to treat the item as a single element or split it out to separate chart elements. For example, say a document was tagged with a managed metadata attribute for 2 business functions, "IT" and "HR", K-Charts can consider these tags separately and so include the item in both the "IT" and "HR" group or alternatively treat them as their own combined group i.e. "HR, IT".
Date Based Grouping	Date values can also easily be used to group items.	Even though a SharePoint date column must be set with a specific value, K-Charts support grouping dates into commonly used time periods, specifically: — **Day**: All items that share the same date value but excluding the time component. — **Week**: All items within the same week. — **Month**: All items within the same month. — **Quarter**: All items with the same quarter. — **Year**: All items with the same year. Most often, date ranges will be combined for grouping purposes (so, items will be grouped by Month and Year for example) but they don't have to be. If you are trying to spot monthly trends in a data set that spans multiple years you can group items by their month value alone.

[2] The Approval Status column is managed by SharePoint internally and is only available when the data source is a document library that has been configured to require Content Approval.

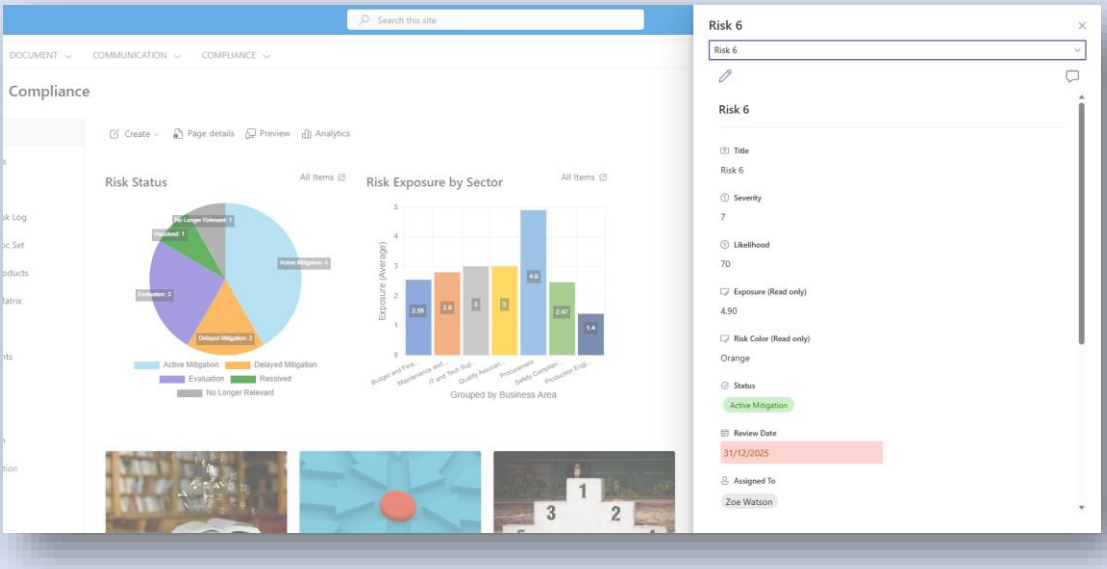
Feature	Key Points	Notes
Aggregation Functions	When data items are grouped, their values need to be evaluated or combined in some way in order that a group data value can be used in the visualisation. Group data is combined using an aggregation function.	The following aggregation functions are supported for grouped data sets: — **Count**: The number of SharePoint items within the group. — **Sum**: The sum of all data column values in the group. — **Average (Mean)**: The mean value of grouped items. — **Median**: The median value of grouped items. — **Standard Deviation**: The SD value of group values. — **Variance**: The variance of group values. — **Max**: The maximum value in the group. — **Min**: The minimum value in the group. — **First**: The first value in the group. — **Last**: The last value in the group.
Custom Sorting and Filtering	Items returned by the selected view, provide an initial filter and a default sort order but further filter settings and custom ordering can be applied as required	K-Charts allows you to group items in ways that are not possible in the standard list views such as by Content Type, Approval Status and by a Date Range. Additional filtering and ordering criteria can be then applied within the web part.
Chart Types		As the solution leverages the Chart.js library, the full gamut of chart types provided by that library is also supported in K-Charts. Specifically: — Bar — Bubble — Column — Doughnut — Line — Pie — Polar Area — Radar — Scatter
Chart Type Specific Settings	There are a wide range of configuration settings which can be applied to each type of chart.	Chart-specific, configuration settings are detailed later in this document.
Axis Settings	Data axis settings are highly configurable. You can choose which data values are used by which axis to generate the chart and how the axis information is displayed.	All chart types support data grouping but some chart types only require a single set of data values. Radial charts (Pie, Doughnut, Radar and Polar charts) only require a single radial axis. All other chart types require both a vertical and a horizontal (X/Y) axis, but Bar, Column and Line charts are considered category charts and still only require a single set of data values.

Feature	Key Points	Notes
		Scatter charts require 2 sets of data values that get plotted on the X and Y axis. Bubble charts require 3 sets of data values where the 3rd set is used to control the size (radius) of the bubble. Axis can be formatted customised in numerous ways, including: — How and if data to be shown on the axis is grouped. — What numeric columns in the data source list are used as axis data. — For grouped data sets, how the data values within each group are to be combined into a single value, by selection of an appropriate aggregation function. — Whether the axis is shown (or not) — How the axis data is presented including font size, color and text angle and with the ability to truncate long labels. — How grid lines are displayed including color, width and line type (dashed or solid). — Whether an axis title is displayed and how it is displayed. — An automatically generated axis label (based on the data column, grouping and aggregation function) will be used by default but this can be replaced with custom label text as required.
Custom Scales	Scales are automatically generated by default, but custom scale setting can be applied if required.	By default, the scale shown on a data axis will automatically be generated, based on the range of values returned by the data set. However, the scales applied to X and Y axis can be customised as required, by optionally setting: — A range minimum value — A range maximum value, by default this will be the upper value of the data attribute displayed on the axis. — A step value, used to set how frequently tick marks are added to the scale
Data Labels	There are a wide range of settings that can be applied to labels displayed on, or next to, chart elements. K-Charts will automatically apply a default label configuration based on the selected chart type, but this can be customised.	In addition to being able to control the text shown on chart elements, you can also control: — The label font size, color and text angle. — The anchor-point for the label and apply a vertical offset from the anchor if required.

Feature	Key Points	Notes
		— Whether the label can span multiple lines or should be shown as a single line of text.
Tooltip	Custom tooltips can be shown whenever the user hovers over a chart element.	Tooltips can be customised in a myriad of ways, including: — Whether they are shown (or not). — Whether to include information from an additional column on the data source list. — Whether to show Created/Modified and/or Created by/Modified by values. — Customising the tooltip font size and color. — Setting a background color.
Color Formatting		Chart item color can be controlled in 6 ways: — **Palette**: There are 17 pre-defined color palettes to choose from. — **Custom**: You can specify single or multiple custom color values that will get used on a repeating pattern. — **Label**: You can map label names to color values using exact matching or wildcards. — **Column**: You can specify a column on the source list that returns a color value. — **Date**: You can color code chart items based on a date value as on offset from the current date and time. So overdue items might be colored red for example. — **Heat**: You can use a heat map to color code item values to provide a color based visual comparison between items in the data set.
Chart Title Formatting	By default, the chart will be shown with an automatically generated chart title based on the selected source list and view. However, the chart title can be customised and formatted in numerous ways.	Specifically, the chart title can be configured as follows: — Whether it is shown (or not). — Whether a custom title value is used instead of the automatically generated title text. — Where the chart title is displayed, either top (default), bottom, left or right of the chart area. — The title font size and color.
Chart Area	The chart area can be filled with a custom color. A chart can be shown with a custom aspect ratio	The background fill for K-Charts is normally transparent such that it will show the background color applied to the section background based on the theme selected

Feature	Key Points	Notes
		for the SharePoint site or Teams site. However, you can set the chart background color to any custom color you like. Be default, a chart is rendered with an aspect ratio of 2:1, meaning that the chart area will be twice as wide as it is high. However, you can adjust the aspect ratio in the range 1 to 5. An aspect ratio of 1:1 will result in a square chart area, whereas an aspect ratio of 5:1 will make the chart area 5 times wider than it is high.
Theme Responsive	K-Charts have been designed to be theme responsive and to look good regardless of whether a dark or light theme has been chosen for the SharePoint site.	Whilst K-Charts is responsive to both the theme used on the site and the color of the section in which a web part has been added to a site page it is also highly configurable in the use of background colors and font colors. K-Charts is also color responsive when used in Microsoft Teams.
Web Part Header	K-Charts can be displayed with or without a web part header	Whether you need both a chart title and a web part title, is a design decision. In keeping with standard SharePoint web part you can select the header style and so font size of the web part title.
Show View Link	The title area of the web part can be configured to show a link to the list view used as the data source for the chart.	The link redirects the browser to the URL of the view. Alternatively, a custom link to any resource can be provided, or no link at all.
Animation Settings	K-Charts support chart animations which make the page more engaging.	You can control the following animation settings: — **Animation Period**: A value between 0 and 5 seconds over which the chart animation should occur. Setting the animation period to zero will effectively disable any animations. — **Animation Easing**: The function used to generate a desired animation effect. There are 31 different effects to choose from!

Feature	Key Points	Notes
No Items	It could be that a web part is connected to a view that returns no list items. A custom message can be displayed to inform users when this is the case or alternatively the web part can be configured to render nothing at all, making it essentially invisible on the page.	K-Charts behaves differently when a web part has been added to a page but not yet configured. When a web part is not properly configured a "Configure" button will be displayed to indicate that the web part requires configuring. Clicking the Configure button, whilst in page edit mode, will open the web part's property pane.
List Item Interaction	A unique feature of K-Charts is the ability to ability to interact directly with the SharePoint item properties which drive the visualisation, as shown in the screenshot below.	When this feature is enables, clicking a chart item will open the property sheet for the SharePoint item that is used to generate that chart element. If the chart groups data items, clicking on the group element will open a property panel with an item picker. Users then simply select the appropriate item from the picker to load the SharePoint item property sheet. If the user has read and write permission on the selected SharePoint item, they can update item property values directly from the property sheet. If the user has read-only permissions, then the controls will operate in read-only mode. Note that this feature is only available with a paid license and is disabled in the freemium product version.

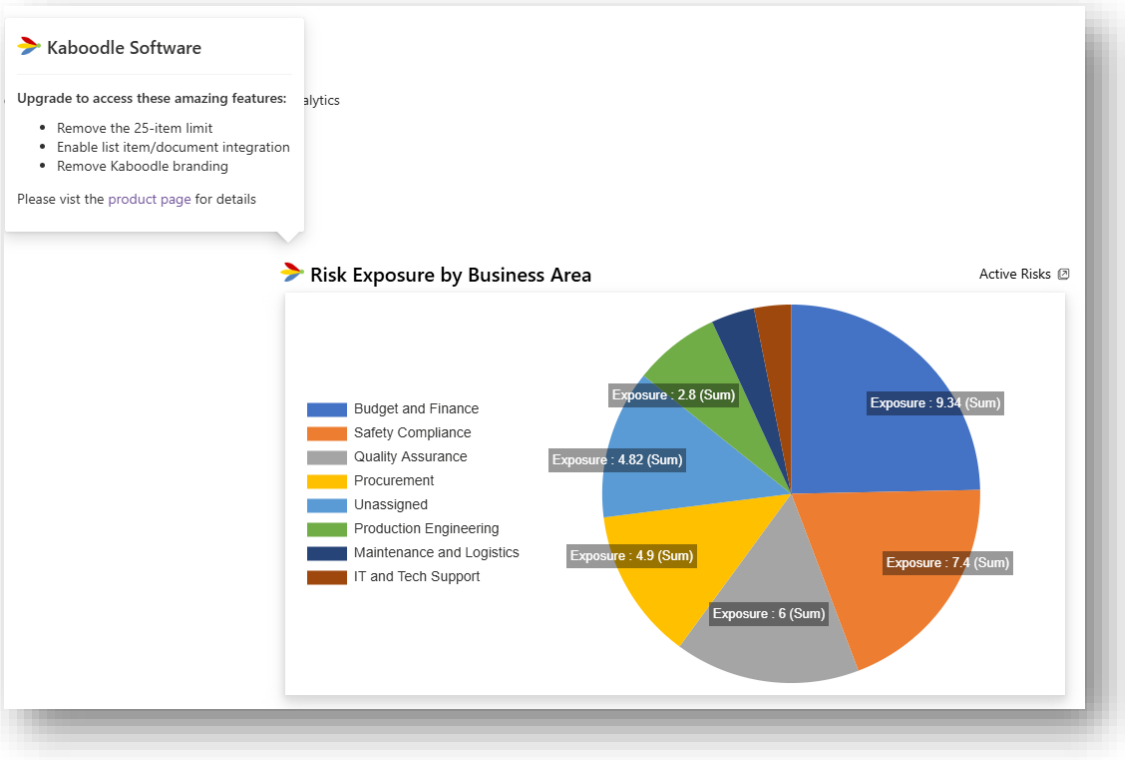


Premium Features

K-Charts is a freemium and fully product that can be used without a license or registration. You can simply download, deploy and use it.

However, for modest annual cost (based on the number of licensed users in your tenancy) you can purchase a full license to unlock premium features, specifically:

- **Remove 25 Item Limit**: The freemium version restricts the number of items used to generate a chart to 25. A paid license raises this limit to 5000 items.
- **Enable Item Interaction**: As mentioned above, interaction with list items is disabled in the freemium version.
- **Remove Kaboodle Branding**: A paid license will remove the light Kaboodle branding, which is displayed with the freemium version as shown below:



If you would like to purchase a license you get automatically generate a quote on the Kaboodle web site at https://kaboodle.software/Buy. You can pay by credit card or bank transfer.

Note that K-Charts is part of the K-Optics product group and there is a significant discount when purchasing a group license and an even greater discount when purchasing an all products license. You can also claim a further discount if you are NFP organization.

Alternatively, if you would like to try a full license version of any Kaboodle product, please register for a free trial license at https://kaboodle.software/Trial

The trial license process is fully automated. After registration you will be sent a trail activation link which will start you trail from that time forward. A trial license will expire after 30 days but if you need longer, you can request an extension.

When a trial or full license expires, the product simply falls back to operating in Freemium mode.

Aim

The aim of this document is to guide you through the processes of installing the K-Charts solution package and how to add and configure web part instances in SharePoint Online.

Whilst this document is detailed, you will be creating your first K-Charts visualisations, in no time at all!

Downloading and Installing K-Charts

This section explains how and where to download the solution package and how to install it in the App Catalog of you SharePoint Tenancy.

Download the Solution Package

The solution package is downloadable from the product support page which can be found at:

https://kaboodle.software/Solutions/K-Optics/K-Charts

The latest copy of this document can also be accessed from this page.

The download link will provide access to a single solution package file named **k-optics-charts.sppkg**.

Installing the Solution Package

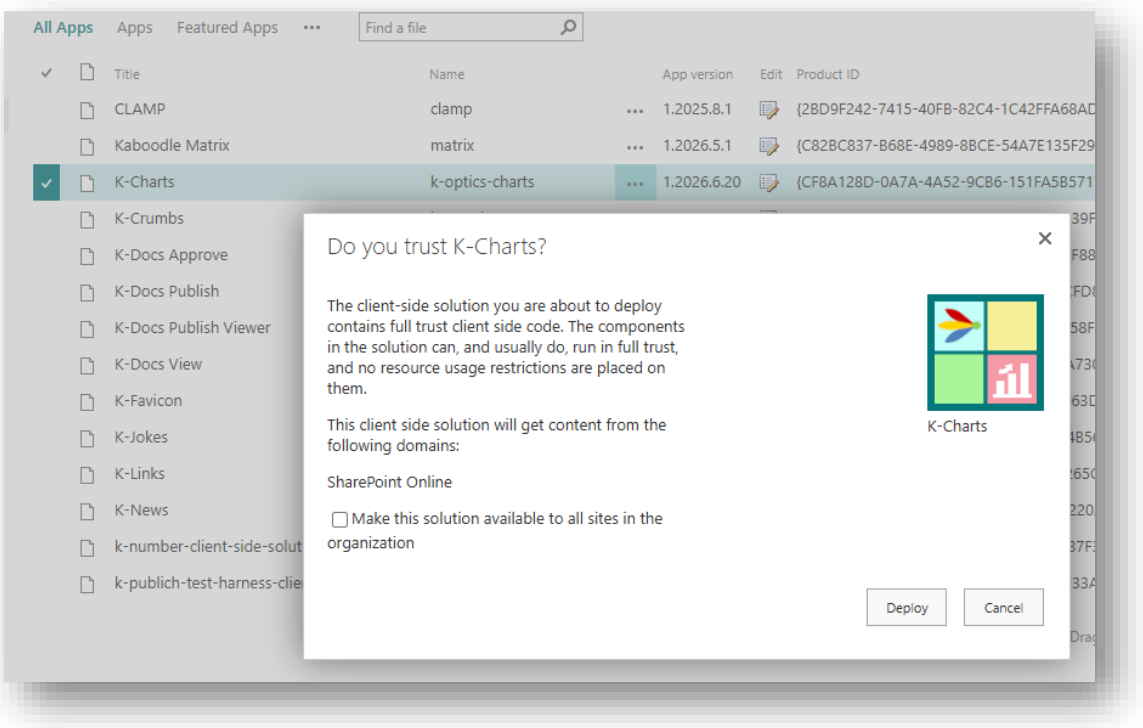
To install the solution package, simply upload the file (or drag and drop it from the file system) to the **Apps for SharePoint** gallery in **App Catalog** site for your tenancy.

Alternatively, you can install it on any **Site Collection App Catalog**, which may be useful if you first want to trial the solution. Note that Site Collections do not come with their own App Catalog as standard and they can only be provisioned (usually by an Administration) using PowerShell.

K-Charts uses the SharePoint Framework (SPFx) API only and does not require access to external resources such as the Graph API. This means that it is not necessary for an administrator to grant special permissions to the solution.

When the package has been uploaded you will be presented with a deployment dialog as shown below[3].

[3] Note that on first upload the application icon may be missing, this is a limitation with SharePoint that affects all apps and is not specific to K-Charts. After initial deployment application icon, as shown in the screenshot, will be displayed.



Note that the web part comes with an option to be globally deployed. If this checkbox is checked, the web part will be available everywhere in your tenancy without the need for site owners to explicitly add the K-Charts App to their sites. If you leave the option unchecked, then the K-Charts App will have to be explicitly installed before it can be used in a site.

After making you deployment option choice, click the **Deploy** button to deploy the solution package and make it available for users.

Unless there is a good reason not to, we recommend that you deploy K-Charts globally, so that it will become immediately available for use by all users in your tenancy.

Updating the Solution Package

We make regular updates to all our products and in most cases, you can update a solution package simply be replace the old solution package file with the newer version and re-deploying the application.

If K-Charts has not been globally deployed the solution package will usually be globally undated everywhere it is used. Although the App Details from Site Contents might inform you that a newer version is available, it is generally unnecessary to explicit install the newer version on a site.

Uninstalling and Removing K-Charts

If you now longer wish to use K-Charts, the recommended approach to remove the solution from you tenancy is as follows:

- Remove all web part instances from any site pages which may be hosting them
- If the solution has not been globally deployed, delete it from the Site Contents page of all Site Collections in which it was used and (optionally) remove the solution package from both the first and second stage recycle bins of the site.

— Delete the solution package file from the App Catalog and optionally remove it from both recycle bins

Adding a K-Chart Web Part to a SharePoint Site Page

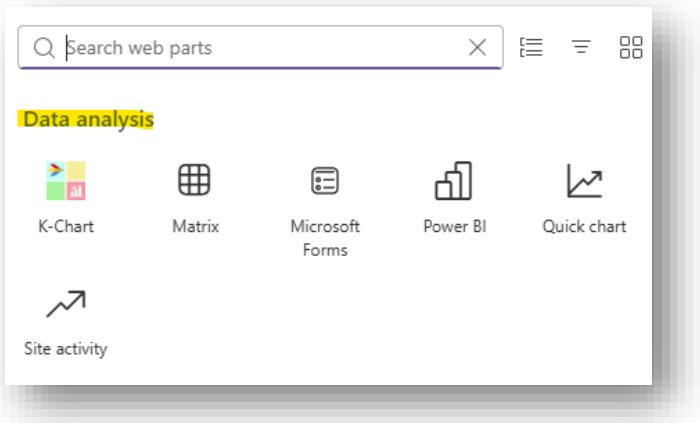
This section assumes that K-Charts has been globally deployed and so the K-Chart web part will be available to all sites in the tenancy without the need of any further action. If K-Charts has not been deployed globally, it will first be necessary to add the K-Chart App to each site which is intending to use the capability.

The process of installing an app is not detailed in this document but it is the same method used to install any app in SharePoint. Simply go to the site contents page and click the **Add an app** link and click on the K-Chart application icon to begin the installation process. Installing apps can sometimes take a while and the app icon will appear greyed out while the solution is being installed on a site.

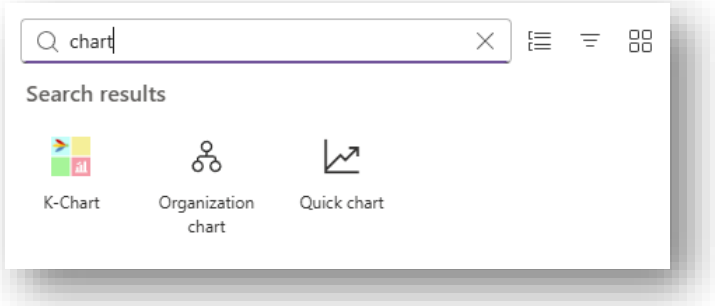
When the process is complete, the app icon will no longer appear greyed out, indicating that the installation was successful and that the app is ready for use.

To add a K-Chart web part instance to a SharePoint Modern site page simply access the page and switch to page edit mode.

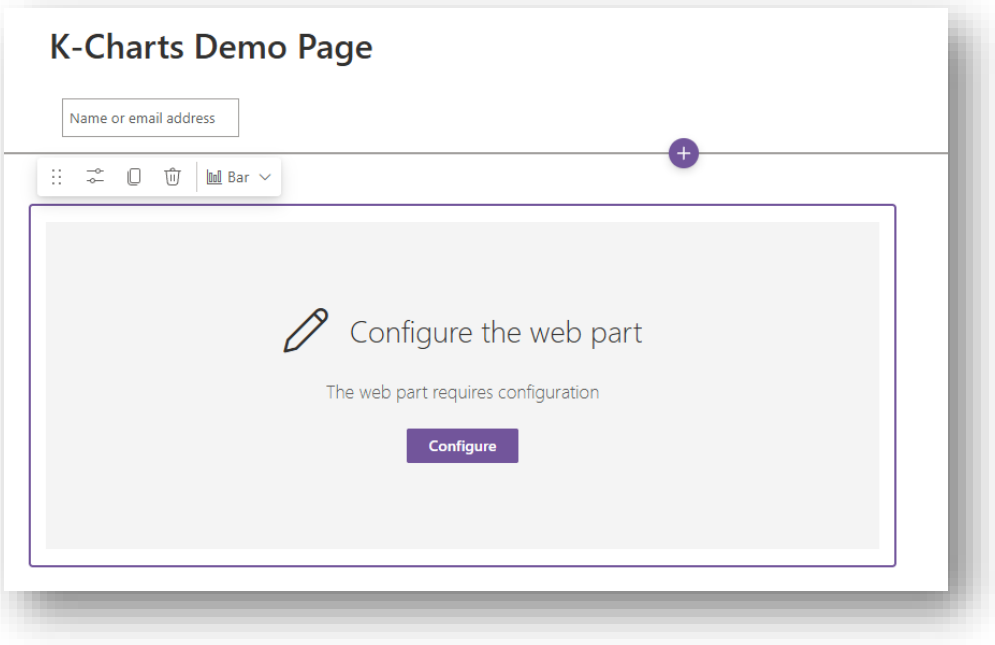
From an appropriate section and column on the site page, click the add a web part link, in the usual way, to access the web part picker dialog. K-Charts is in **Data analysis** group.



However, the easiest way to locate it, is to start typing ‘K-Chart’ or just ‘chart’ into the web part picker dialog.



Then click on the K-Chart item icon to add a new K-Chart web part instance to the page. The web part will then be added to the page and display a message that it needs to be configured.



When in page edit mode, clicking the Configure button will open the property pane for the web part which will enable web part properties to be set with appropriate values.

A Sample Data List

To show how K-Charts is configured and to demonstrate the capabilities of the solution it is necessary to have access to a suitable list that will act as the data source. This section provides a simple scenario for using a list and explains how such a list has been configured.

This list will then be populated with some sample data items and then used to demonstrate how K-Charts is configured and how it operates.

Use Case Scenario

This sub-section outlines a simple use-case scenario that results in the provision of a SharePoint list than can then be used as the data source for generating K-Chart visualisations.

The senior management team of our fictious organisation have decided that they need to maintain a high-level log of potential risks to the business. Risks could be from any area of the business such as IT, Operations, HR, Sales, Procurement etc. and someone from that functional area is assigned as the Risk Manager with responsibilities to monitor and manage that risk, on behalf of the business.

All risks should be subject to a quarterly periodic review, where exposure is assessed to ensure that it is always an accurate reflection of risk. Exposure is calculated, based on:

- **Severity Assessment**: An assessment of the severity that the risk poses to the organization if manifested. Severity is measured on a scale of 1 to 10 (1 being that if the risk is manifested, it will have a slight impact on operations, whereas an assessment value of 10 will result in a total shut down).
- **Likelihood**: A percentage assessment of the probability that the risk will manifest to a real issue.

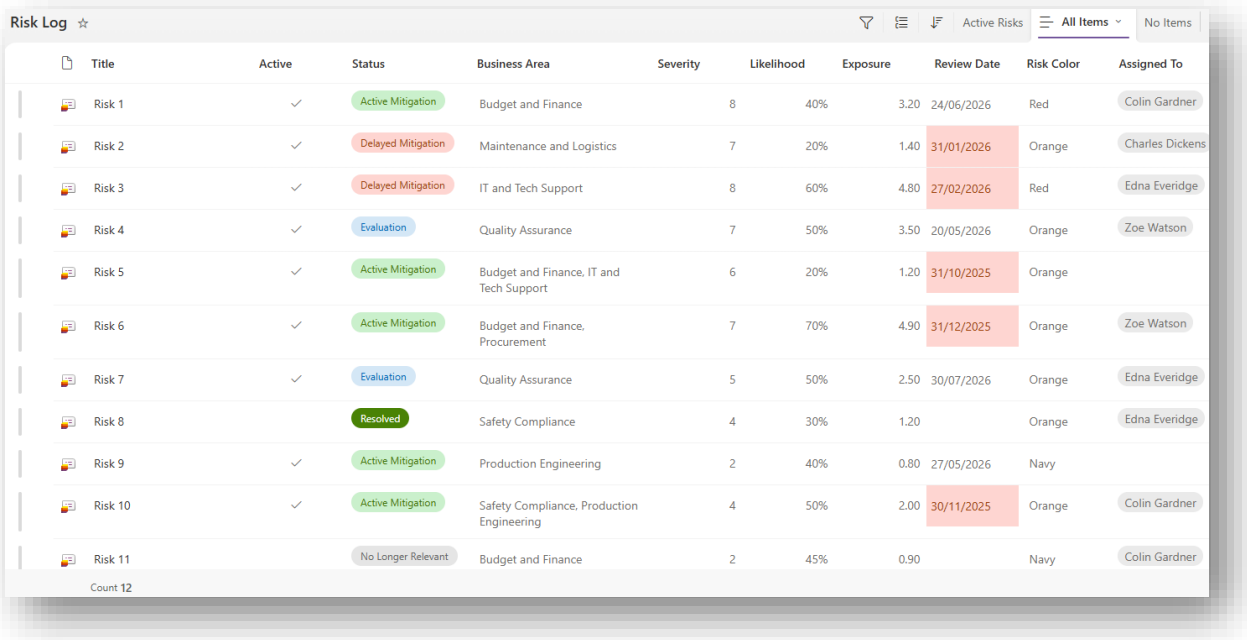
The Exposure to the business, posed by each risk item, is calculated simply by multiplying the Severity Assessment by the Likelihood. So, a low-severity/low-likelihood risk will present a minimal Exposure but a high-severity/high-likelihood risk presents a clear threat to ongoing operations.

Risk Log Structure

The risk log has been developed using a simple SharePoint custom list, which consist of the following data columns[4].

Column	Type	Comments
Severity Value	Number (1-10)	User assessment of the severity of the risk
Likelihood	Number (%)	User assessment of how likely this risk will arise
Exposure	Calculated (num)	Indicates the exposure the risk presents worked out as - Severity * Likelihood
Severity	Calculated (text)	Based on the value of Exposure returns either High, Medium or Low
Risk Colour	Calculated (text)	Returns a colour value based on Severity as either Red, Orange, Navy
Status	Choice (single value)	User set choice value to indicate the status of the risk
Active	Calculated (yes/no)	Based on the Status values return a Y/N value to indicate if the risk is Active
Next Review	Date	User set date to indicate when the risk should next be reviewed
Assigned To	User (Person)	The person currently assigned to manage the risk
Business Function	Managed Metadata	The functional area(s) of the business relevant to the risk

The Risk Log has been populated with 12 high-level risks to the business, though 2 of these have already been closed out as being “Resolved” or “No Longer Relevant”.


Risk Log ☆

Active Risks | All Items | No Items

Title	Active	Status	Business Area	Severity	Likelihood	Exposure	Review Date	Risk Color	Assigned To
Risk 1	✓	Active Mitigation	Budget and Finance	8	40%	3.20	24/06/2026	Red	Colin Gardner
Risk 2	✓	Delayed Mitigation	Maintenance and Logistics	7	20%	1.40	31/01/2026	Orange	Charles Dickens
Risk 3	✓	Delayed Mitigation	IT and Tech Support	8	60%	4.80	27/02/2026	Red	Edna Everidge
Risk 4	✓	Evaluation	Quality Assurance	7	50%	3.50	20/05/2026	Orange	Zoe Watson
Risk 5	✓	Active Mitigation	Budget and Finance, IT and Tech Support	6	20%	1.20	31/10/2025	Orange	
Risk 6	✓	Active Mitigation	Budget and Finance, Procurement	7	70%	4.90	31/12/2025	Orange	Zoe Watson
Risk 7	✓	Evaluation	Quality Assurance	5	50%	2.50	30/07/2026	Orange	Edna Everidge
Risk 8		Resolved	Safety Compliance	4	30%	1.20		Orange	Edna Everidge
Risk 9	✓	Active Mitigation	Production Engineering	2	40%	0.80	27/05/2026	Navy	
Risk 10	✓	Active Mitigation	Safety Compliance, Production Engineering	4	50%	2.00	30/11/2025	Orange	Colin Gardner
Risk 11		No Longer Relevant	Budget and Finance	2	45%	0.90		Navy	Colin Gardner

Count 12

Please note the following:

[4] A real Risk Log would obviously contain additional columns such as Description and Mitigation Approach etc.

- Not all risks have been assigned a Risk Manager.
- Some risks belong to more than one Business Function.
- Some risks are late for their quarterly review.

A couple of useful views have been defined on the list:

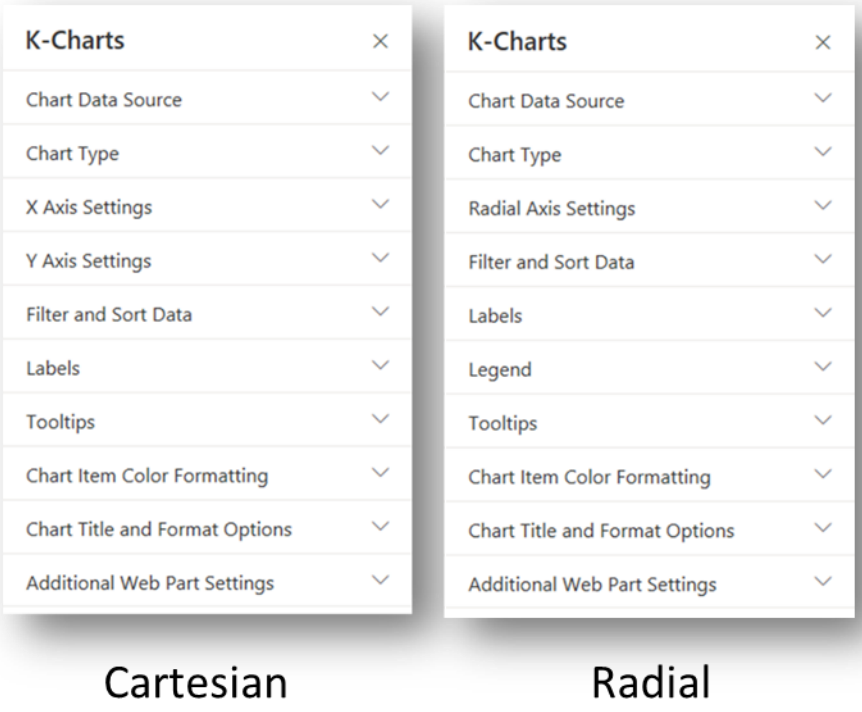
- **All Items**: Shows all items in the risk log (as shown in the screenshot above).
- **Active Risks**: Shows only those items where the Active column returns Yes. Note that Active is a Calculated column which simply returns No when the Status is set to "No Longer Relevant" or "Resolved", otherwise Yes is returned.

The Risk Log has also been configured with an additional view which has been configured to return no items. We shall be using this view later to demonstrate how K-Charts can behave when the selected view returns no results.

The task before us, is to provide a data visualisation for the Risk Log using K-Charts.

Web Part Configuration

After clicking the Configure button, on an unconfigured K-Chart web part, the web part property pane can be accessed.



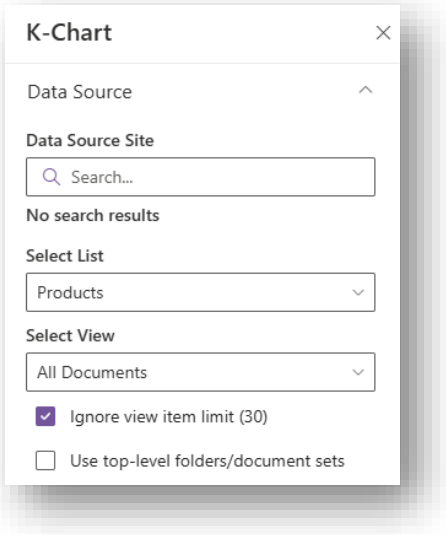
The property pane is split over 2-pages, but all the web part configuration settings are presented on the first page which consist of the 10 groups as shown in the above screenshots.

Note that the set of property groups varies slightly depending on whether the selected chart type is Radial (Pie, Doughnut, Polar Area or Radar) or Cartesian (Bar, Column, Line, Scatter or Bubble). Radial charts have a Radial Axis Settings group where Cartesian charts have X Axis and Y Axis Settings groups.

Radial charts can also be configured to show a legend and so have a Legend group. Legends are not currently available in Cartesian charts.

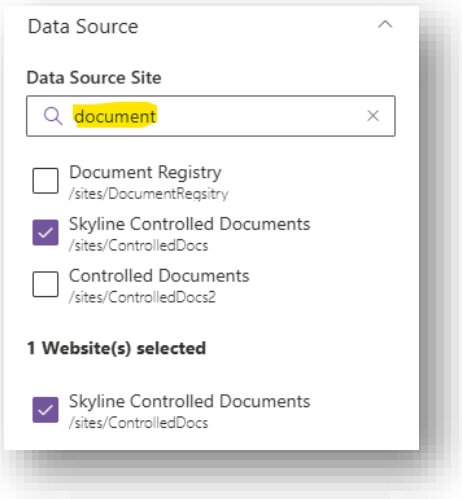
The sub-sections which follow, will guide you through the purpose and function of the controls and property settings within each of these control groups.

Chart Data Source



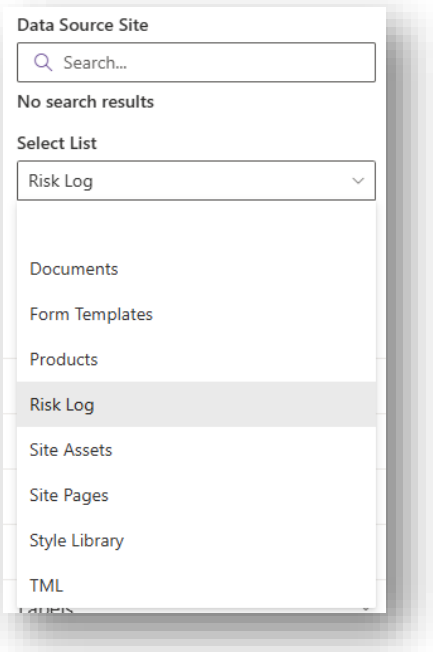
This group consist of the following controls:

- **Data Source Site Picker**: This control is used to select the site in which the data source (list or library) resides. If no specific site is selected, the solution assumes that data source is in the local site but any other site in the tenancy can be selected.[5] To select a different site simply start typing the site name and a filtered list will be display from which one can be selected.[6]

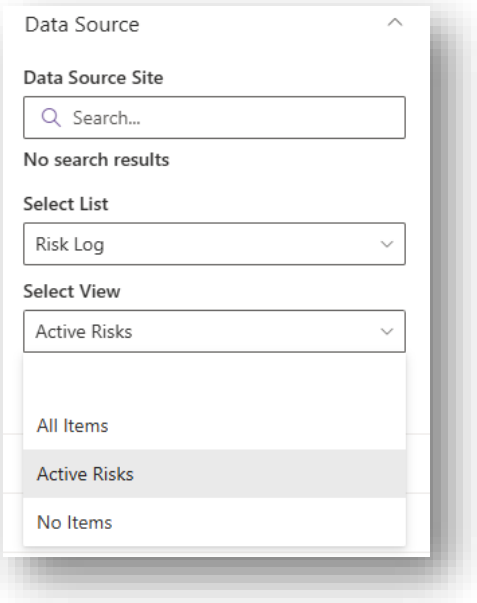


- **List Picker**: The **List Picker** enables the selection of any visible list or library in the site, for use as the data source for the visualisation. If the **Data Source Site Picker** control is used to select a different site, this control is reloaded with the list and libraries for that newly selected site.

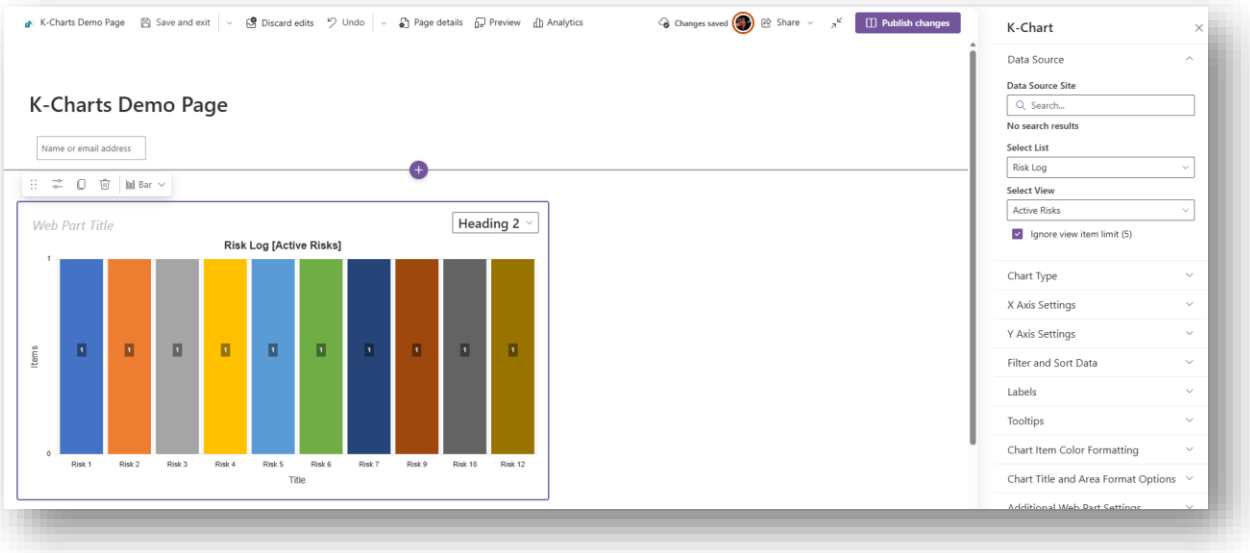
[5] When connection to a data source is a remote site, care must be taken to ensure that users have at least read-level access to the data on which the chart will be based.
[6] Note that this control uses SharePoint search to return the list of sites and a newly provisioned site may not be immediately available for selection.



— **View Picker**: The **View Picker** is dynamically loaded with all public views defined on the list or library selected in the **List Picker**, as can be seen in the screenshot below:

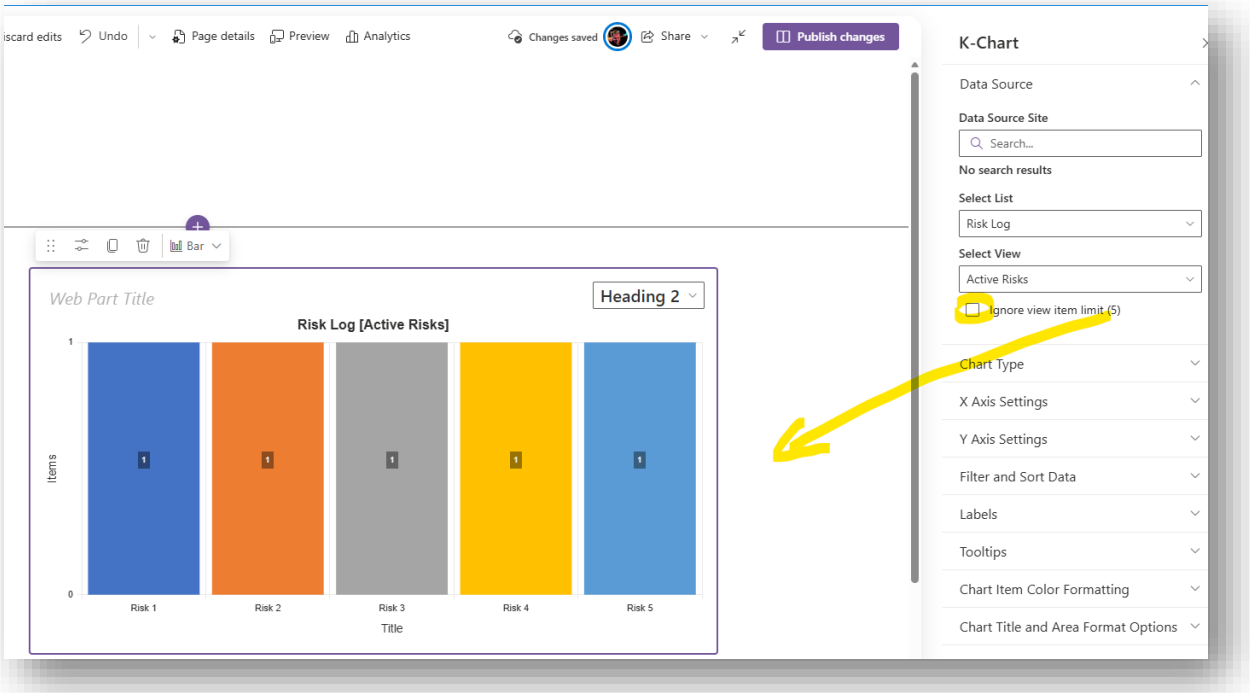


Selection of an appropriate source list and view are the only properties that are needed to render an output in K-Charts.



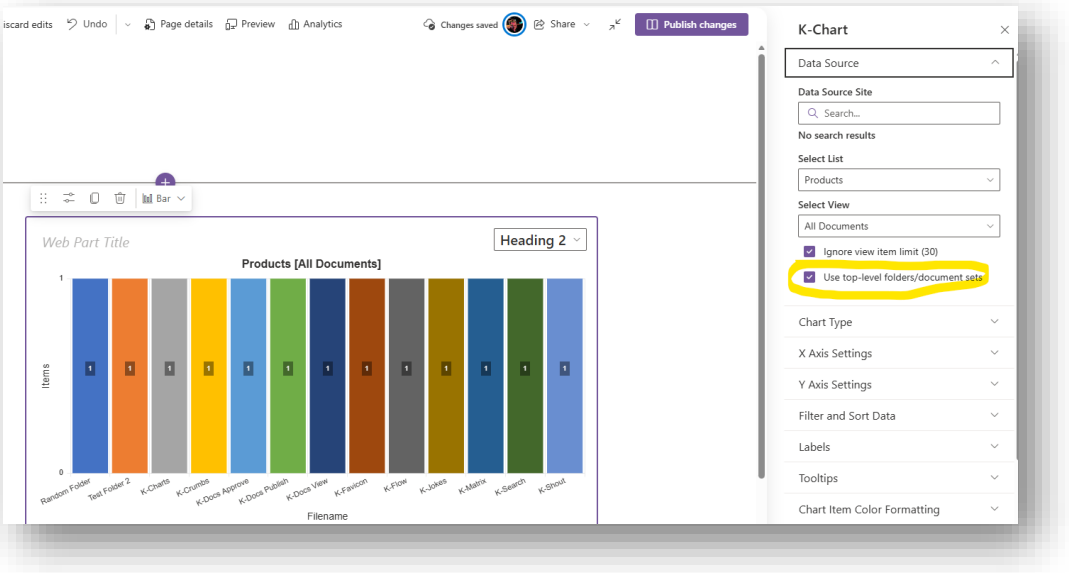
Notice that changing the selected view may change the number and sort order of items shown in the Chart. In the above screenshot, the Active Risks view was selected, which excludes inactive risks and so only 10 of the 12 items are rendered (Risk 8 and 11 are excluded).

- **Ignore view item limit checkbox**: By default, a standard SharePoint view sets a page limit of 30 items. This checkbox (checked by default) will ignore that item limit and therefore base the chart on all items that pass the view filter criteria. However, there may be scenarios in which you would want to limit the items. If you uncheck this setting the view limit will be applied. In the screenshot below, the view limit has been set to just 5 items and so the chart is based on only the first 5 items returned by the view.



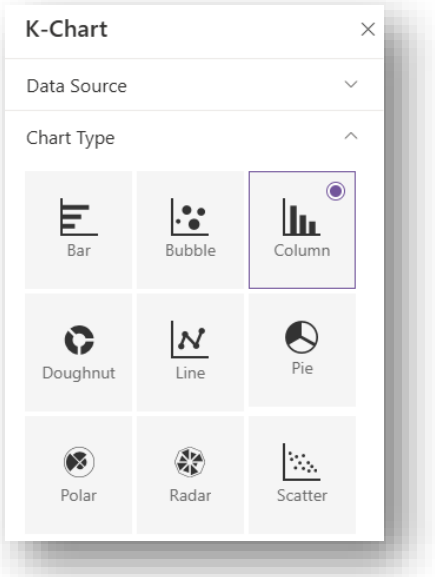
- **Use top-level folders/document sets checkbox**: If the chart data source is a document library, this checkbox can be used to instruct the web part to generate the chart based on top-level

folders or (more usually) document sets. When selected, all documents with the library are not used to generate the chart. When unchecked, folders/document sets are ignored, and the chart will be based on the document items returned by the view.



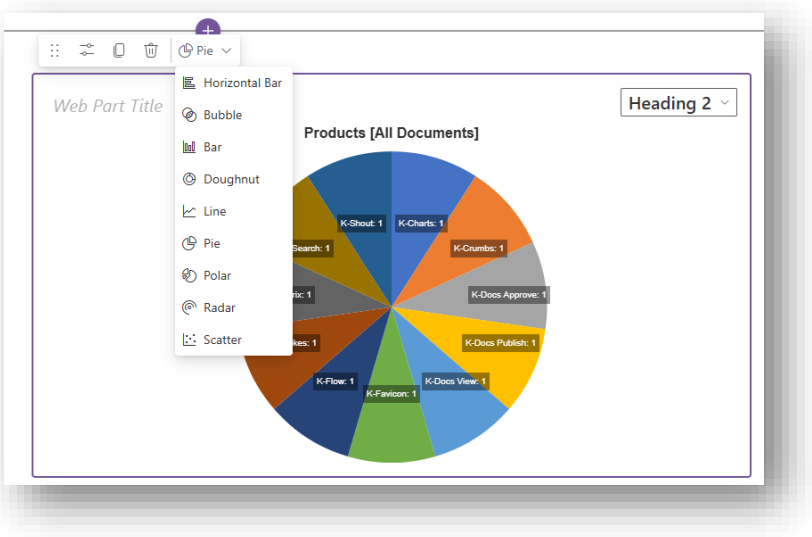
Note that when basing the chart on documents, the view is always flattened, such that the folder structure is ignored, regardless of how the source view is otherwise configured.
This control is not displayed if the data source is a standard SharePoint list.

Chart Type



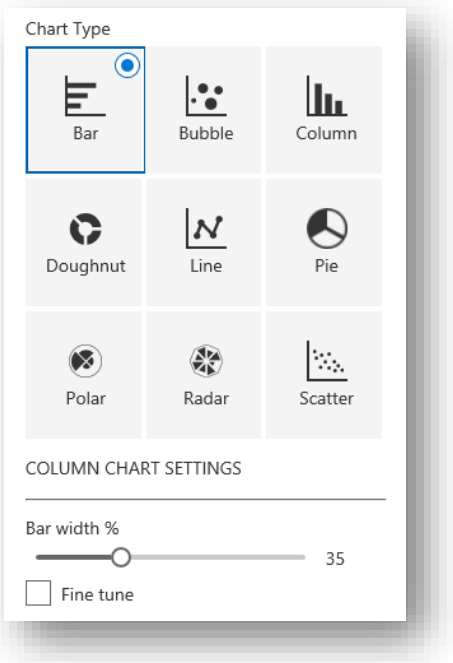
K-Charts supports 9 chart types as shown above and briefly described in the features table presented in the Key Features section of this document. You can switch between chart types at any time, just by selecting a different option using the above **Chart Picker** control.

Alternatively, you can use the chart picker in the web part tool bar.



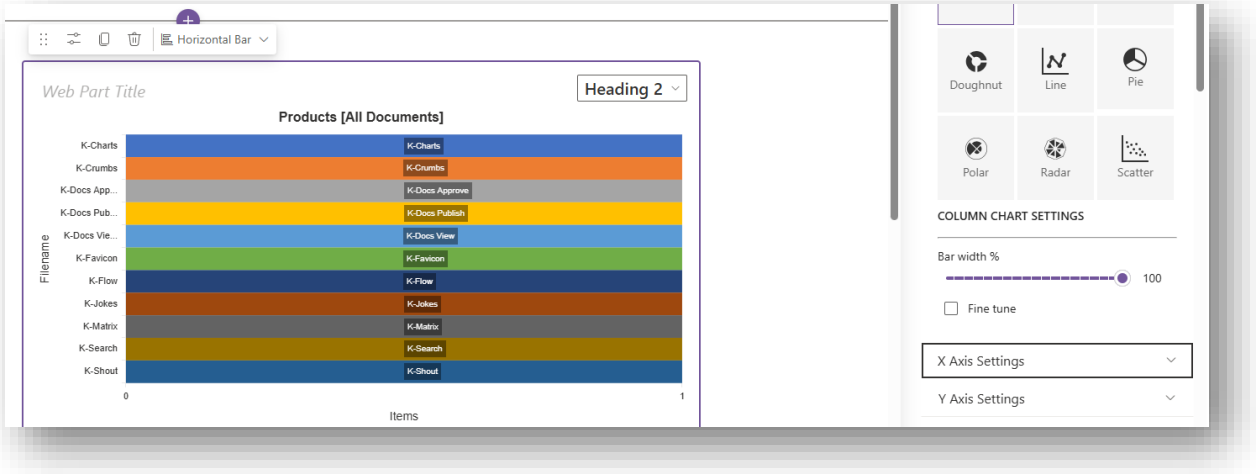
Beneath the Chart Picker, additional controls will be made available. These controls allow you to apply chart type specific settings and so the number and type of these controls vary depending on the selected chart type.

Bar and Column Charts

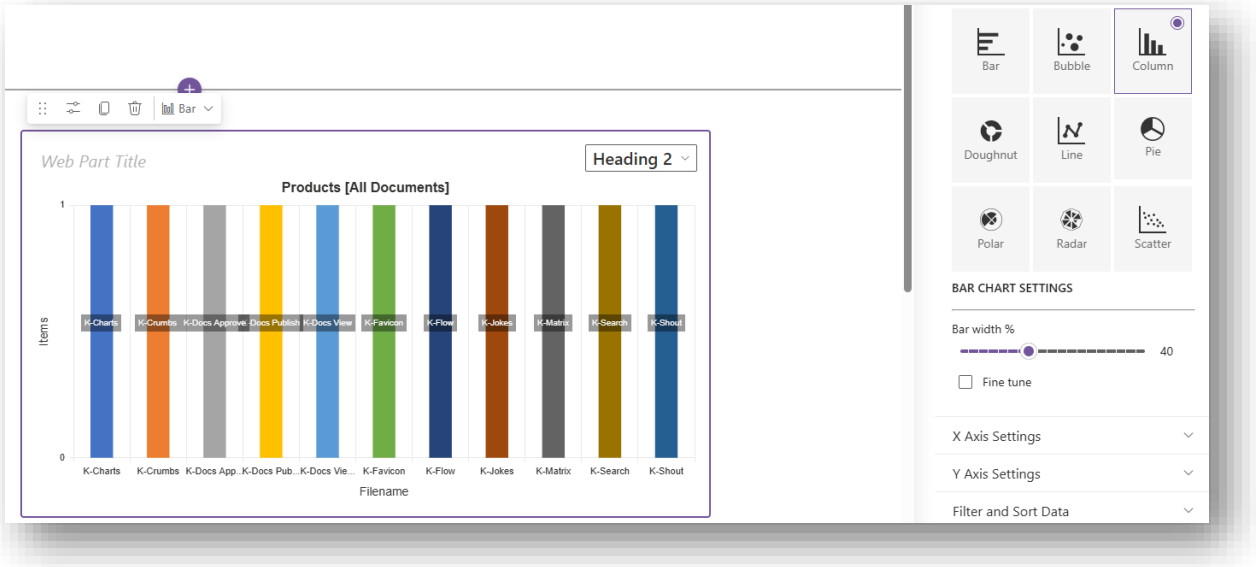


When a Bar of Column chart is selected the **Bar Width Slider** control is shown. This control is used to adjust the width allocated to each bar or column in the chart as a percentage of the available width. The default value is 90% meaning that there will be a 10% gap between columns/bars.

Setting the width value to 100% results in no spacing as can be seen below.



Whereas setting a smaller value will result in skinner bars/columns and greater space between them.

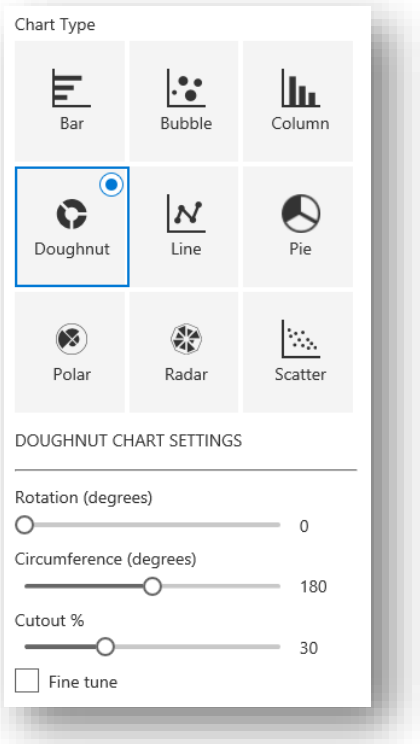


The column/bar width cannot be less than 5%. By default, the slider is set to step with increments of 5% but if you need to fine tune things, clicking the **Fine Tune Checkbox** will enable you to set the width to any whole number % between 5 and 100.

Note that because K-Charts is responsive, the exact width of each bar/column will depend on the screen space available to the chart and that will depend on section configuration and the page column selected to host the web part. It will also depend on the browser window size which is usually determined by the user's device (desktop, laptop, table or smart phone).

In order to make K-Charts usable in all of these scenarios we dynamically control the size of chart elements rather than specifying fixed dimensions and as such, configuration settings such as the bar/column width are often specified as relative values (expressed as a % in this case) rather than absolute values i.e. a fixed number of pixels.

Doughnut and Pie Charts

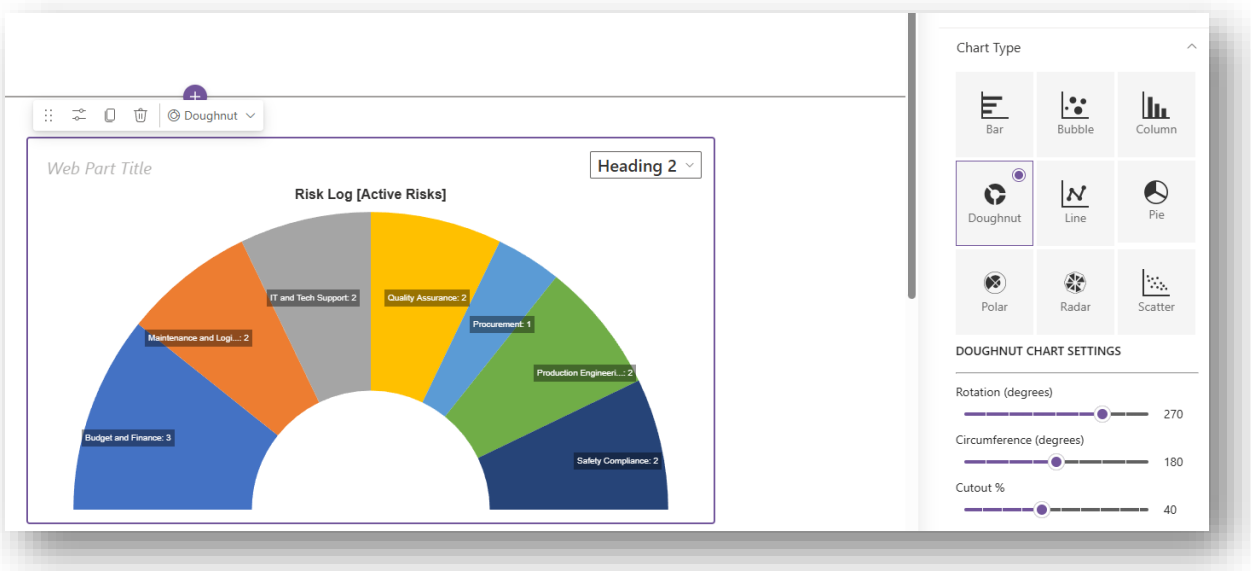


Pie and Doughnut charts are essentially the same except that a Doughnut is a Pie with a hole in the middle! There are a few controls which can be used to configure how Pie and Doughnut charts are rendered:

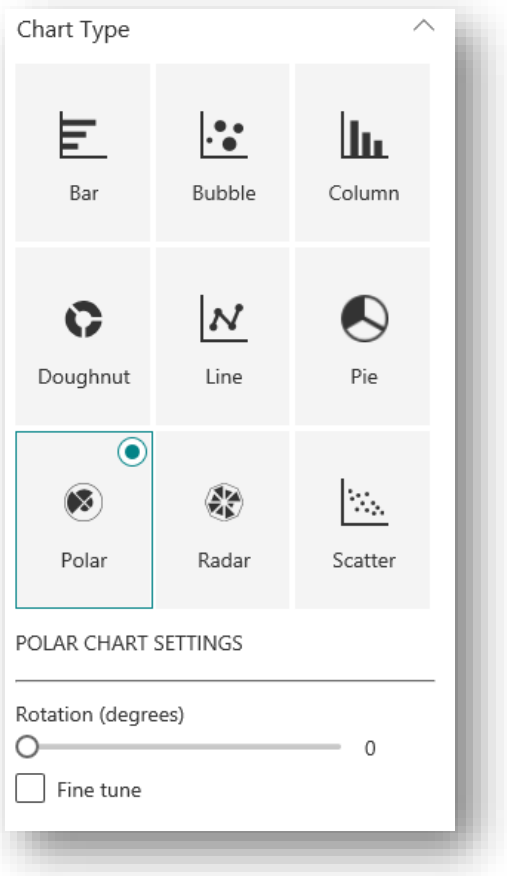
- **Rotation Slider**: By default, chart data is rendered in a clockwise direction from 12 O'clock but you can use the **Rotation Slider** to change the start angle. The slider step value is set to 45 (degrees) but if the **Fine Tune Checkbox** is selected you can set the rotation angle to the nearest whole degree in the range 0 (no rotation) to 360 (full rotation which is also the equivalent of zero rotation)[7].
- **Circumference Slider**: By default, a Pie of Doughnut will be configured to use an arc of a full 360 degrees, but you can use the **Circumference Slider** to change the arc from between 0 (where no chart data will be shown) through any angle to a full circle with 360 degrees.
- **Cutout % Slider**: This control is only shown for Doughnut charts and is used to set the size of the centre cutout as a % of the chart radius. The Cutout % Slider control can be set to a value between 0 (no cutout and so the chart will be the same as a Pie) to 99% (where the chart will be displayed as a ring of colored arcs.

Setting the rotation and the circumference can generate some interesting visualisations, like the fan chart shown below.

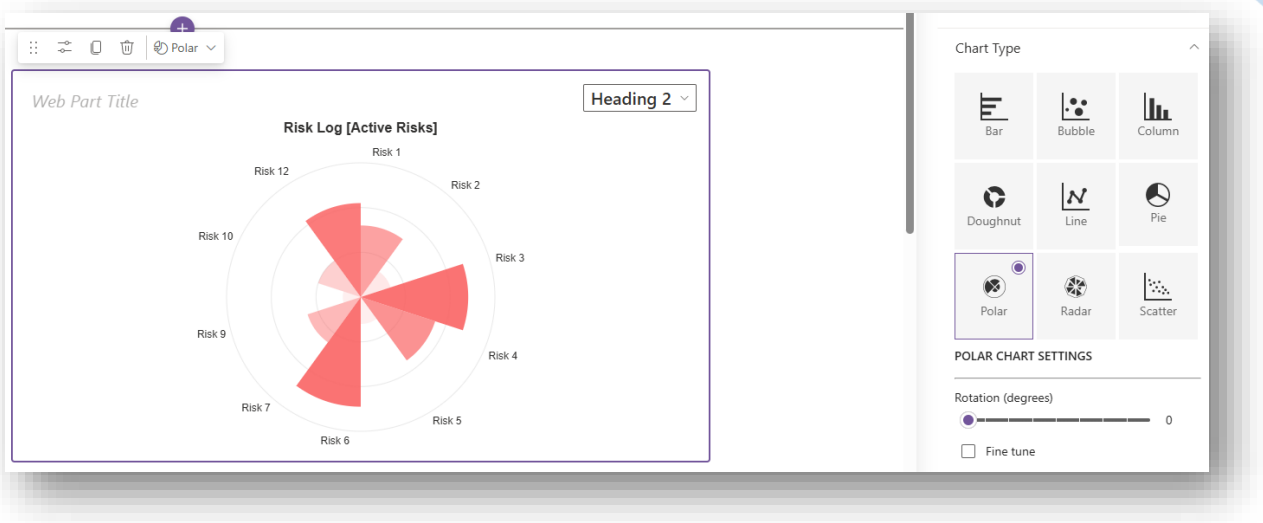
[7] The **Fine Tune** checkbox control is shown many times in the web part configuration interface and is used to allow for the more precise setting of values, mainly in slider controls. As the **Fine Tune** checkbox serves this purpose in a consistent way it will no longer be referred to in the remainder of this documentation.



Polar Area Chart

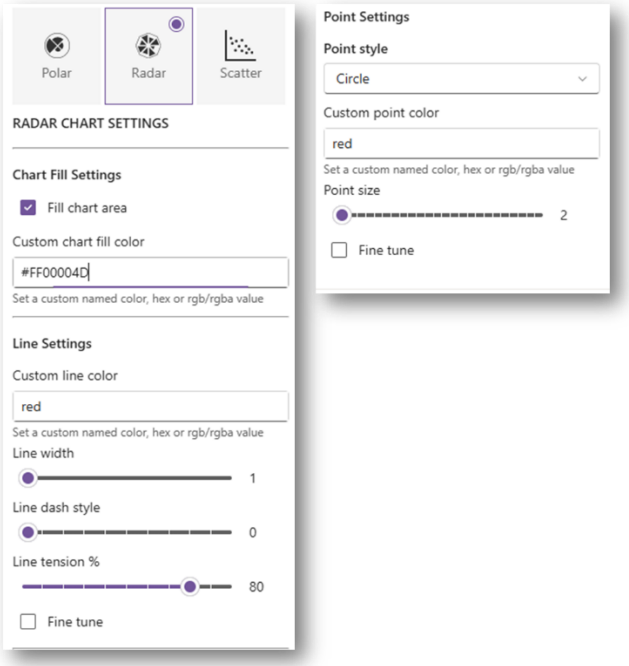


Until a Polar Area chart is configured to use list data it will appear much like a Pie chart, so to demonstrate the chart settings, the radial axis has been configured to use the value in the Exposure column of the source data list. Configuration of chart data columns and colors is described later in this document.



For a Polar Area chart there is only one additional control, the **Rotation Slider**: This works in the same way as a for a Pie or Doughnut chart and is used to control the start angle from which data is presented (which will be zero degrees by default).

Radar Chart

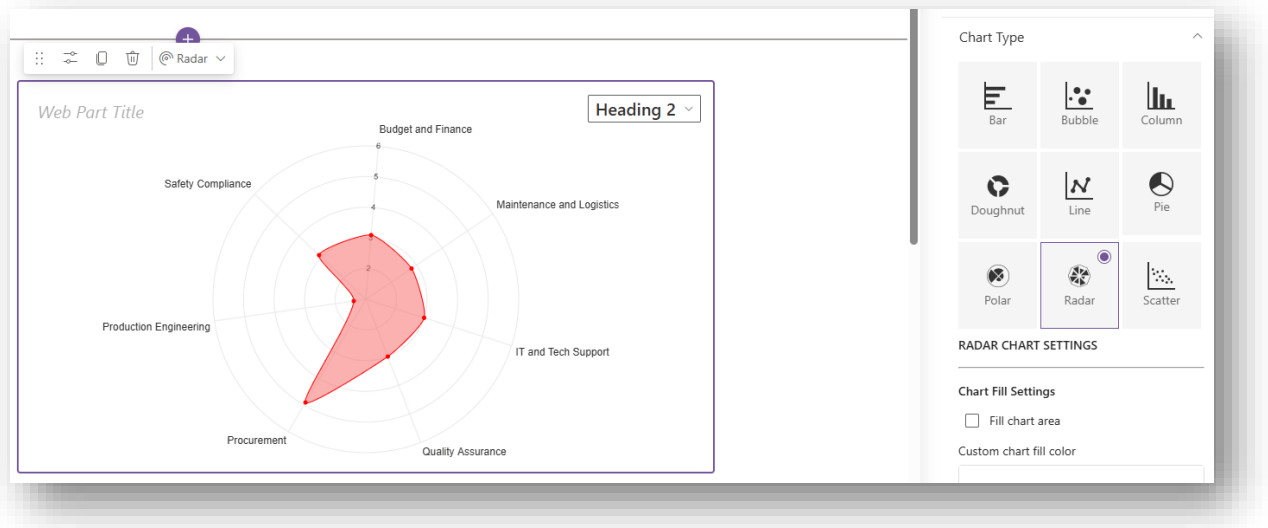


A Radar chart is more complex than other radial chart types and like Polar Area charts, they require configuration with data, to display anything useful. The screenshot below shows a Radar chart that has been configured to show the average risk Exposure value, grouped by the business area. Configuring chart data is described later in this document.

The controls that are used to configure Radar charts are described in the following sub-sections:

Chart Fill Settings

- **Fill Chart Area Checkbox**: When checked the radar chart area will be filled with a fill color. When not checked, no fill color is applied, and the **Custom Chart Fill Color Textbox** is disabled.
- **Custom Chart Fill Color Textbox**: When left blank, the fill color will be automatically derived from the theme color applied to the site, but this textbox can be used to specify a custom color to fill the chart area.



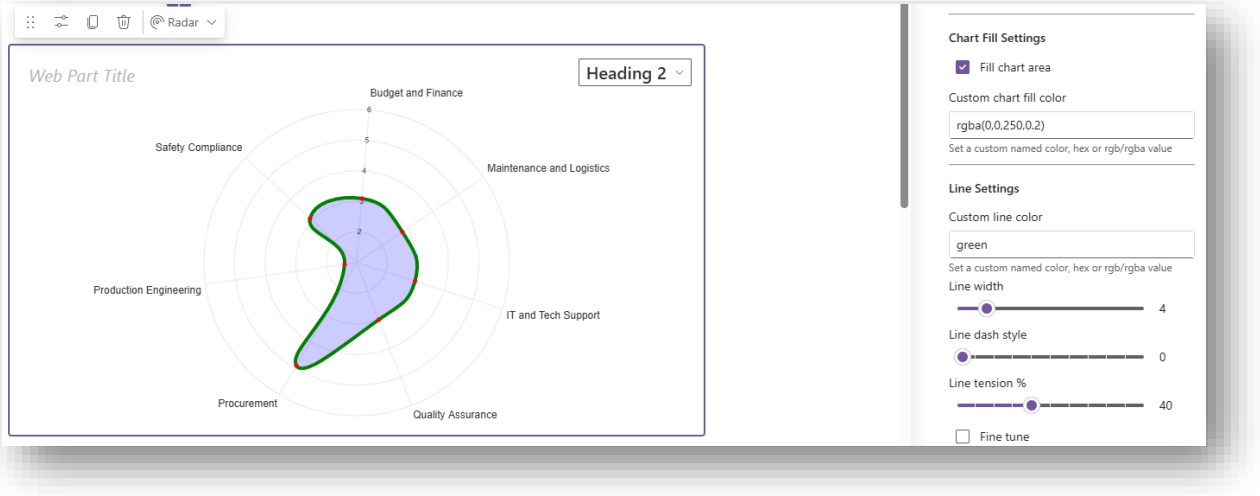
In the above screenshot, the fill area has been set to a red colour with an opacity value (alpha channel) of 0.2, by setting a Hex color code of **#FF00004D**. Using transparency will allow the radial grid lines to show behind the fill area.

Line Settings

This section provides controls which govern how the line segment around the radar plot area is rendered.

- **Custom Line Color Textbox**: Used to specify a custom color for the radar plot boundary line. If you do not want to show the plot line, set the color value to “transparent”.
- **Line Width Slider**: Used to set the width, in pixels, of the radar plot line. A value in the range 1 to 20 can be applied.
- **Line Dash Style Slider**: Used to make the plot line dashed. The value set in the slider specifies the number of pixels for each alternating line and space. The slider can accept values in the range 0 (no spacing and so a solid line) to 50 (each line/space segment will be 50 pixels).
- **Line Tension Slider**: Used to control the line tension as a % value. When the control is set to 100%, full tension is applied so that points in the radar plot will appear as sharp angles. Reducing the tension value will result in a more rounded (less angular) plot area. The default value is 80%.

The screenshot below shows a Radar chart with some custom line setting applied:



Point Settings

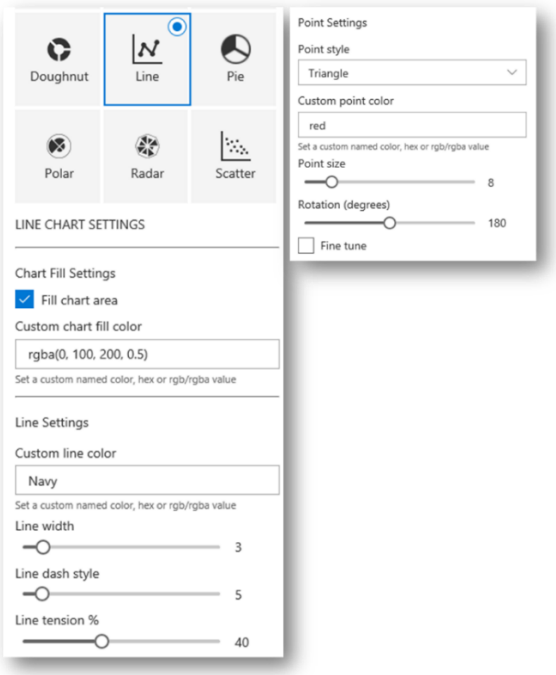
This section provides controls that govern how points are displayed on the chart.

- **Point Style Picker**: This dropdown control allows you to select the type of point that is shown on the chart. The options are:
  - Circle
  - Cross
  - X Mark
  - Dash
  - Line
  - Rectangle
  - Diamond
  - Rounded Rectangle
  - Star
  - Triangle
- **Custom Point Color Textbox**: Used to specify a custom color to be used for data points.
- **Point Size Slider**: Used to control the size of the data point in the range 0 to 50.
- **Rotation Slider**: Certain point styles, such as Cross and Triangle support rotation whilst others such as Circle do not. The **Rotation Slider** control is only shown when a point style that supports rotation is selected in the **Point Style Picker**.

By default, the Circle point style is selected with a size of 3 pixels, using a theme color. The screenshot below shows the chart when custom point settings have been applied.

If you do not wish to show data points, simply set the Point Size to zero or set the custom point color to “transparent”.

Line Chart



To display anything meaningful a Line chart must also be configured to use a list data column. A Line chart has controls grouped in the following sub-sections:

Chart Fill Settings

Contains the same set of controls used to control the fill of a Radar chart as previously described.

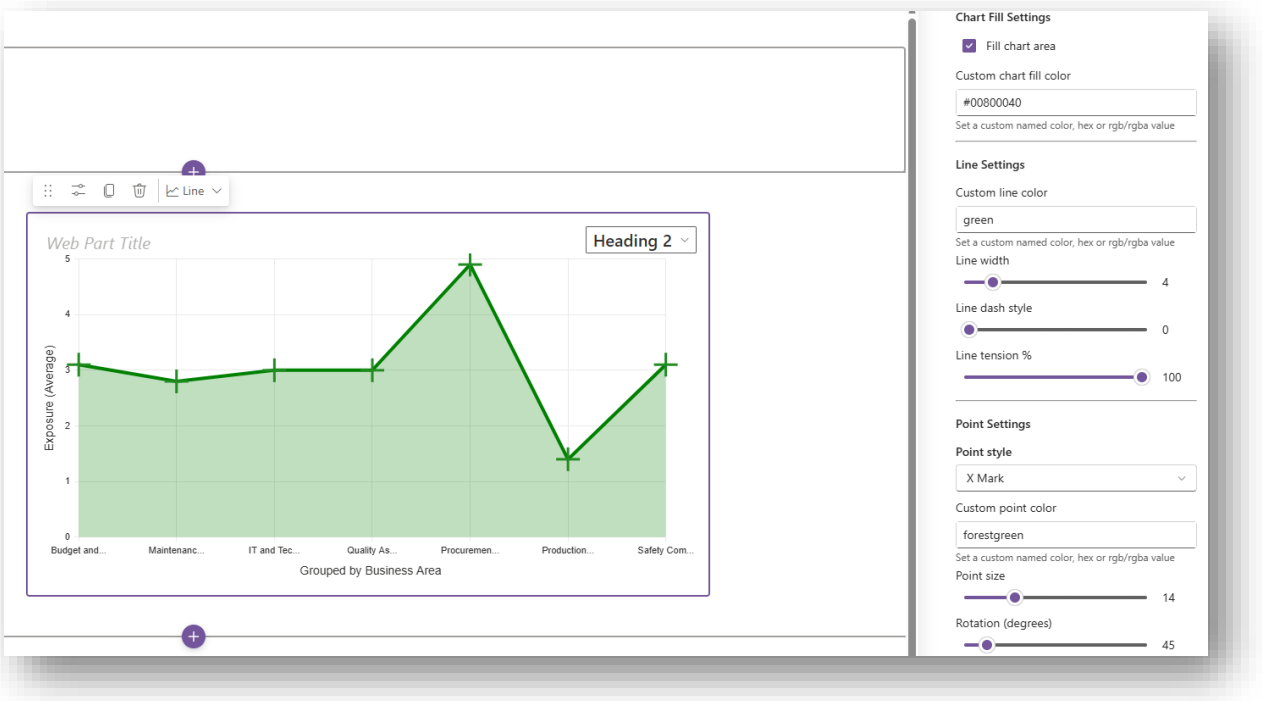
Line Settings

Contains the same set of controls used to govern the plot line of a Radar chart as previously described.

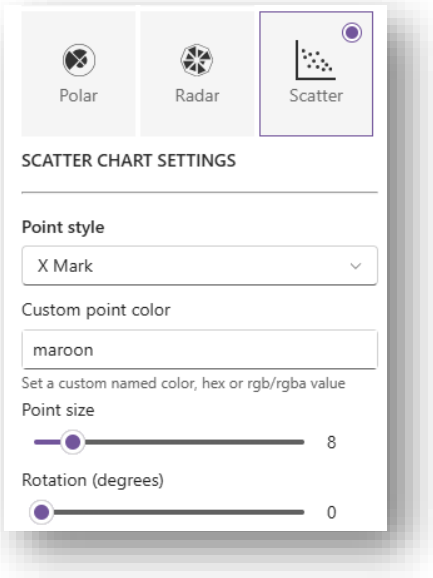
Point Settings

Contains the same set of controls used to govern the point settings of a data point in a Radar chart as previously described.

The screenshot below shows an example of a Line chart configured with a different set of color, line and point style options.

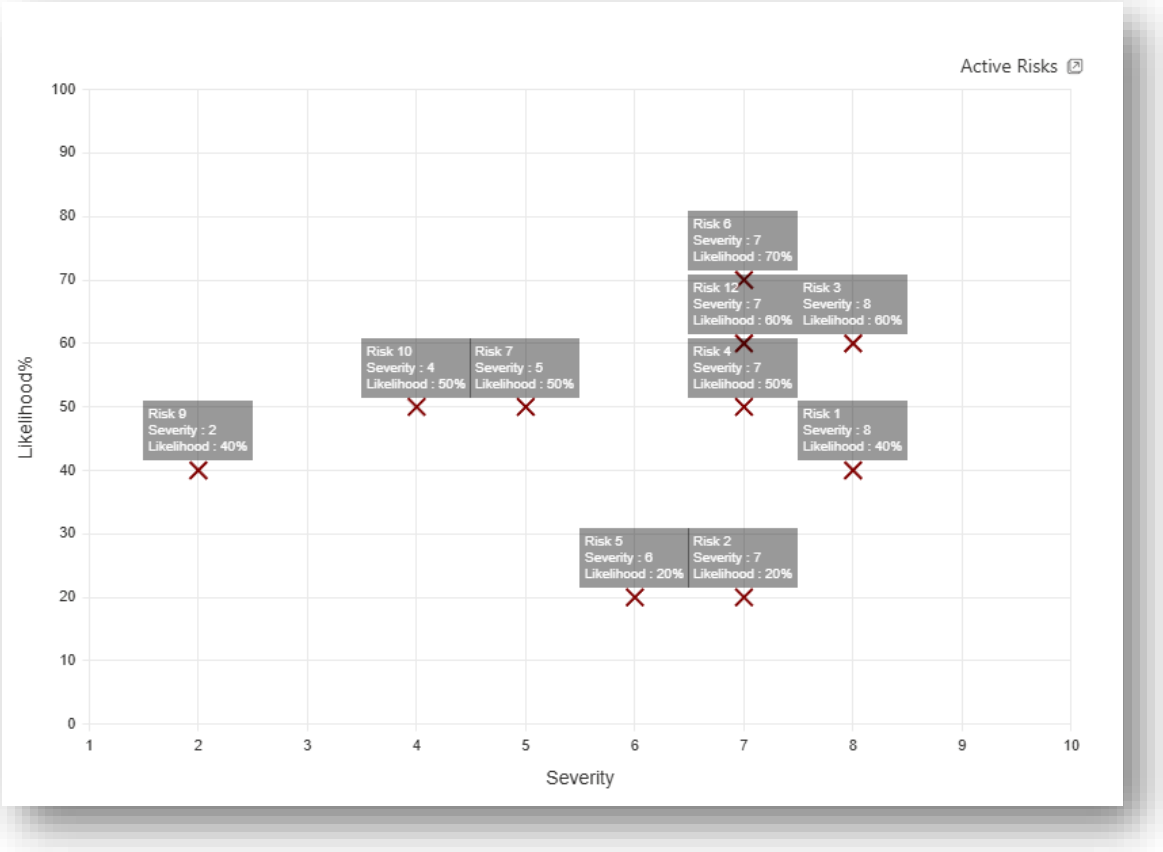


Scatter Chart

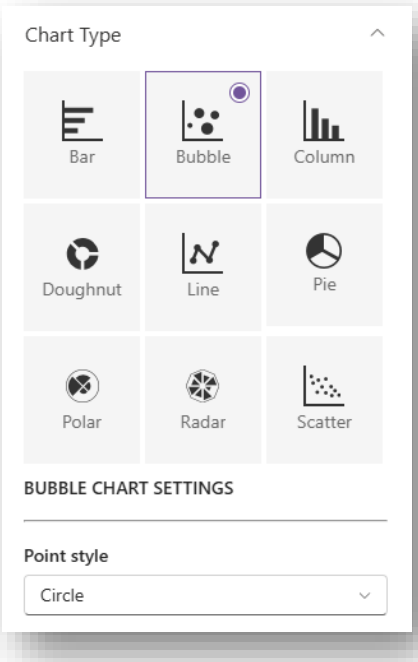


A scatter chart requires 2 data sets, one each for the X and Y axis. To demonstrate the configuration of a scatter chart, the X and Y axis have been linked to data columns in the data source list. The X axis has been configured to show the Severity Value and the Y Axis to show the Likelihood.

A scatter chart offers the same set of controls for configuring data points as those used in a Radar chart and a Line chart, described previously. The screenshot below shows a scatter chart with a different the set of point configuration settings as shown the screenshot above.

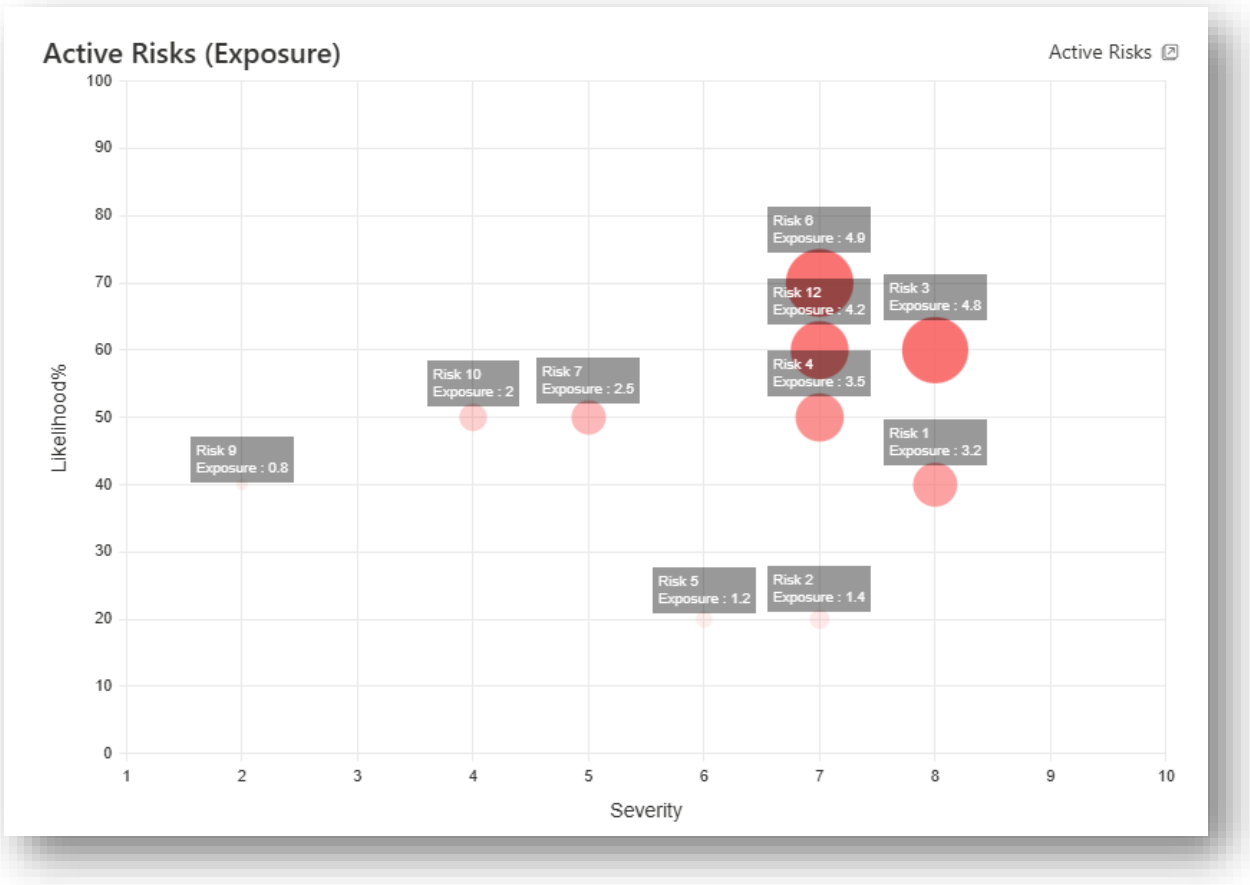


Bubble Chart



A bubble chart is similar to scatter chart in that data values need to be assigned to both the X and Y axis. However, with a bubble chart, a 3rd set of data values can be passed in and the size (normally the radius) of the data point can be used to visualise that extra data dimension.

Most often, a circle is used as the datapoint and their size will vary in accordance with the 3rd data dimension and so the data points look like bubbles, hence the name. The visualisation in the screenshot below uses the Exposure value as this 3rd data dimension to give an indication of where the greatest risks reside.



However, K-Charts allows you to use any of the previously listed point styles and so you are not restricted to using bubbles.

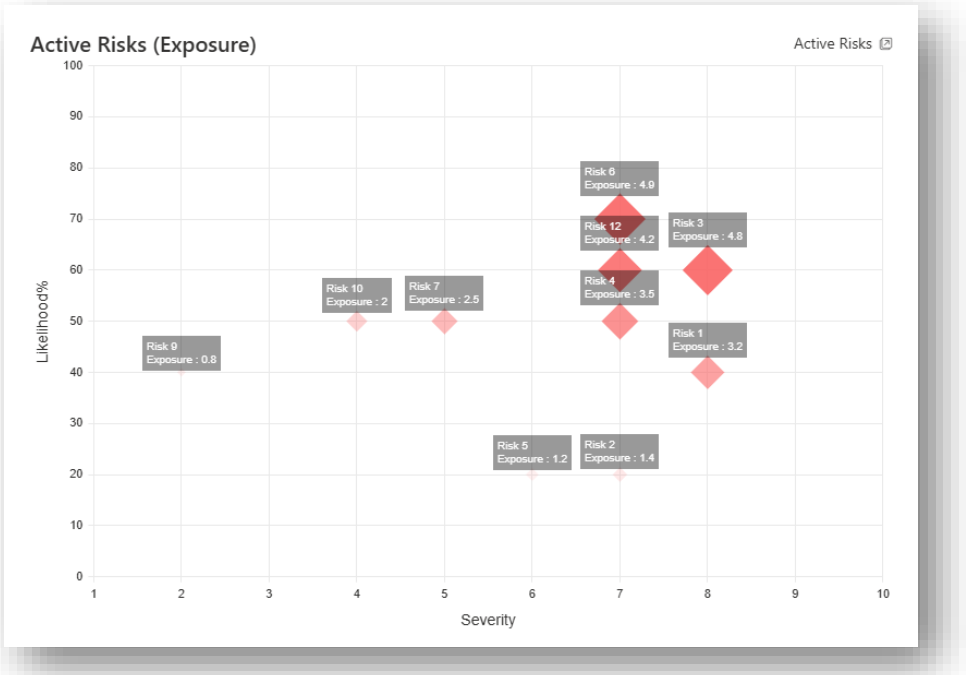
It should be noted that point styles come in 2 distinct types, namely:

- **Line Based Points**: Those data points which are rendered using line segments which are Cross, X Mark, Dash, Line and Star.
- **2-Dimensional Points**: Those data points which are represented by a 2-dimensional element namely: Circle, Rectangle, Rounded Rectangle and Triangle.

When a Line Base Point is selected you can control the color and line width of the point as shown in the screenshot below:

When a 2-Dimensional Point style is selected, the color of the bubble is controlled separately and can be based on conditional business logic. So, for example, any risk that is overdue its quarterly review might be coloured red and those due for review this month might be yellow whilst the others are green. The means by which chart elements can be conditionally formatted is described later in this documentation.

The screenshot below shows the same bubble chart which uses the Diamond data point style and a heat map to control data point coloring (described later in this document).



Note that data point rotation is not supported in bubble charts.

Understanding Chart Data

In the Chart Data Source section of this document, it was explained that a K-Chart web part is first hooked up to a specific view on the source data list or library. The selected view provides a logical and convenient way to filter and sort the set of list items on which a data visualisation can be based but does not provide any data values to generate a chart.

To display a chart that adds business value requires data that can be visualised. With K-Charts, that data comes from the values assigned to SharePoint column for the items or documents returned by the selected view in specified list or library.

This section explains some important concepts behind how column data can be used to drive K-Chart visualisation.

Metadata

SharePoint columns are often referred to as metadata attributes and the set of columns for a list item or document is known as it's metadata profile. Some metadata is provided by SharePoint automatically, but it is likely that you will need additional columns to generate meaningful visualisations.

In the use-case scenario, of an organisational Risk Log, presented earlier in this document, there were several additional columns added to the Risk Log list (please refer to the sub-section titled Risk Log Structure).

A K-Chart web part is connected to the appropriate metadata columns by means of picker controls that are displayed in the Axis Settings groups of the web part properties pane.

Data Axis Control Groups

Depending on the type of chart selected, there can be one or two different Axis Settings control groups displayed in the web part property pane:

- **Radial Charts**: Radial Charts are Pie, Doughnut, Polar Area and Radar and these only require a single data axis, known as the Radial Axis.
- **Cartesian Charts**: All other chart types are known as Cartesian Charts and require 2 axes, namely:
  - **X Axis**: For data values and items to be presented in the horizontal plane.
  - **Y Axis**: For data values and items to be presented in the vertical plane.

Categorical and Numeric Data

The data to be presented in an axis can be:

- **Categorical**: Is used to identify an item or a collection of items with the same value.
- **Numeric**: Provides numeric values that can be used to plot data values.

In SharePoint, certain column types are **Categorical** whilst others are **Numeric**:

- **Categorical Columns**: The following are **Categorical** column types that can be used in K-Charts:
  - Single Line Text
  - Choice
  - Managed Metadata
  - Yes/No
  - Lookup
  - User or Group

    - Content Type
    - Approval Status (on document libraries where content approval has been enabled)
    - Date and Time
    - Calculated (where the column is configured to return a text, date or yes/no value)
- **Numeric Columns**: The following are **Numeric** column types that can be used in K-Charts:
    - Number
    - Currency
    - Calculated (where the column is configured to return a number value)

Categorical columns can be used to group items and K-Charts can use that grouping to bundle the collection of list items or documents within that group and present them as a single chart element (a bar in a Bar chart or a slice of a Pie chart for example).

Note that although Date and Time columns do contain a numerical value, they are primarily considered **Categorical**. This is because we would normally want to group date values into useful time slices such as by the year and month.

The following **Categorical** column types in SharePoint can be configured to accept multiple values, namely:

- Choice
- Managed Metadata
- User or Group
- Lookup

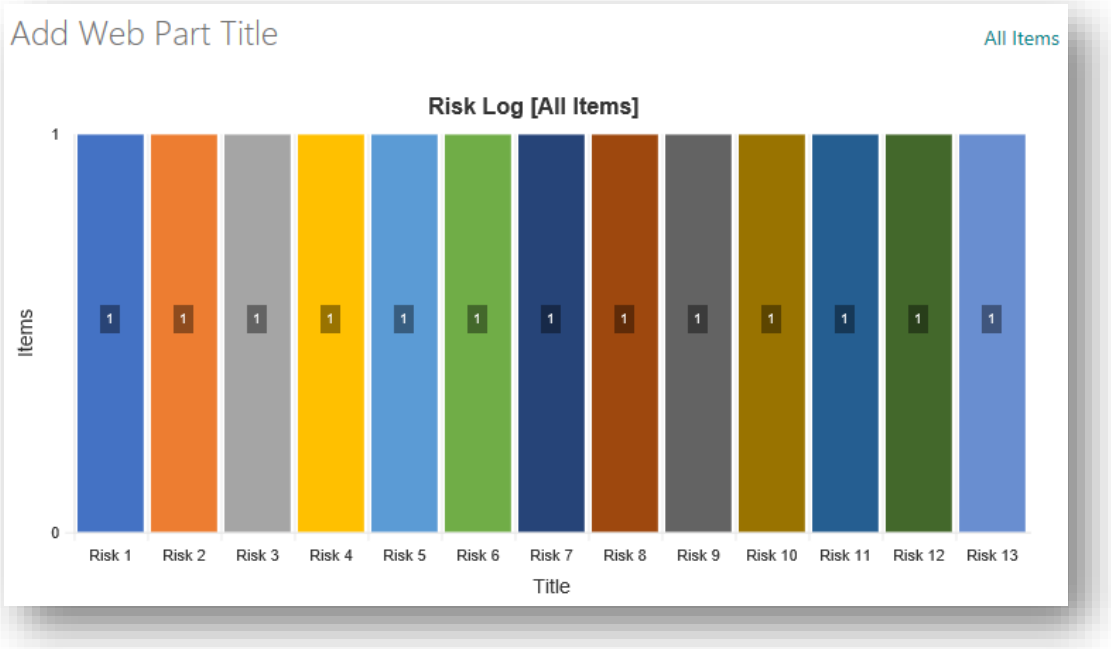
K-Charts fully supports the use of **Categorical** columns that have been configured to accept multiple values.

The data to be shown on axes of a chart depends on the type of chart selected, as shown in the table below:

Chart Type	R Axis	X-Axis	Y-Axis
Pie, Doughnut, Polar Area and Radar	Categorical & Numeric		
Bar		Numeric	Categorical
Column		Categorical	Numeric
Line		Categorical	Numeric
Scatter		Categorical & Numeric	Numeric
Bubble		Categorical & Numeric	Numeric & Secondary Numeric

The axes of a K-Chart web part do not necessarily need to be configured with either a **Categorical** column or a **Numeric** column.

When a **Categorical** column is not specified, items returned by the view will not be grouped but rather they will be represented as individual chart elements. This is why, when you first connect a web part to a view, all items in that view will be shown as individual chart elements as can be seen from the screenshot below.

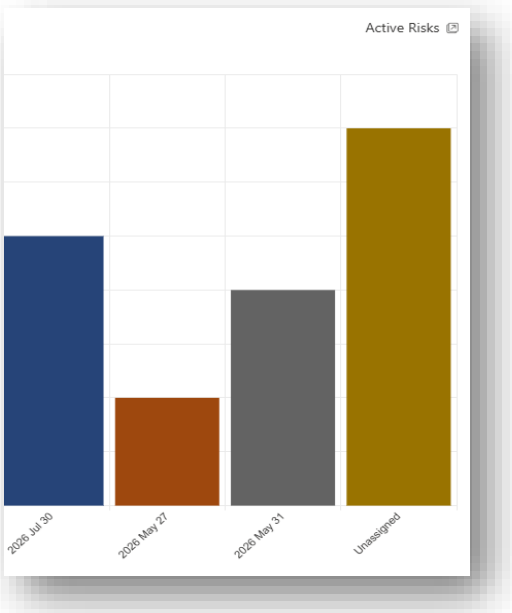


Even though the items returned by the view are not grouped they are identified individually by their title.

In the case where a web part is connected to a document library, you can choice whether to use the document's file name in preference to any title that may (or may not) have been applied.

It can also be seen that because a **Numeric** column has yet to be specified (in the Y axis in this case) all chart elements are the same height because the web part does not yet know which values it should be using to vary the column heights.

Any items that do not have an assigned category value are grouped together in the Unassigned Category.



Data Aggregation

When a **Numeric** column has been applied to an axis in a chart which has also been grouped, it is necessary to specify an **Aggregation Function** which is simply a mathematical method of combining the data values within each group into a single value.

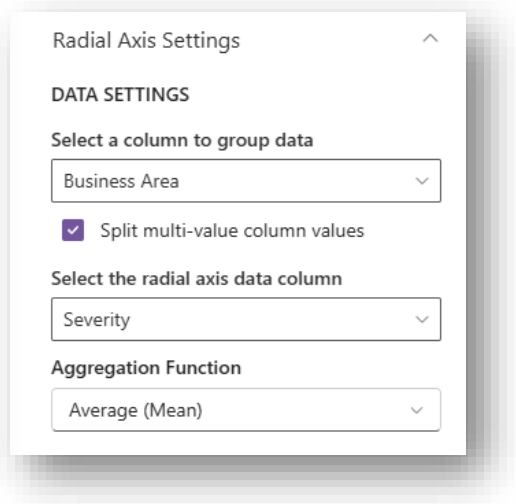
The following **Aggregation Functions** are available:

- **Count**: The number of SharePoint items within the group.
- **Sum**: The sum of all data column values in the group.
- **Average (Mean)**: The mean value of grouped items.
- **Median**: The median value of grouped items.
- **Standard Deviation**: The SD value of group values.
- **Variance**: The variance of group values.
- **Max**: The maximum value in the group.
- **Min**: The minimum value in the group.
- **First**: The first value in the group.
- **Last**: The last value in the group.

The default **Aggregation Function** is **Count**.

Configuring Chart Data

Depending on the type of chart and which **Category** and **Numeric** columns have been selected, there may be up to 4 controls shown the in the Data Settings section of the Axis Settings group:



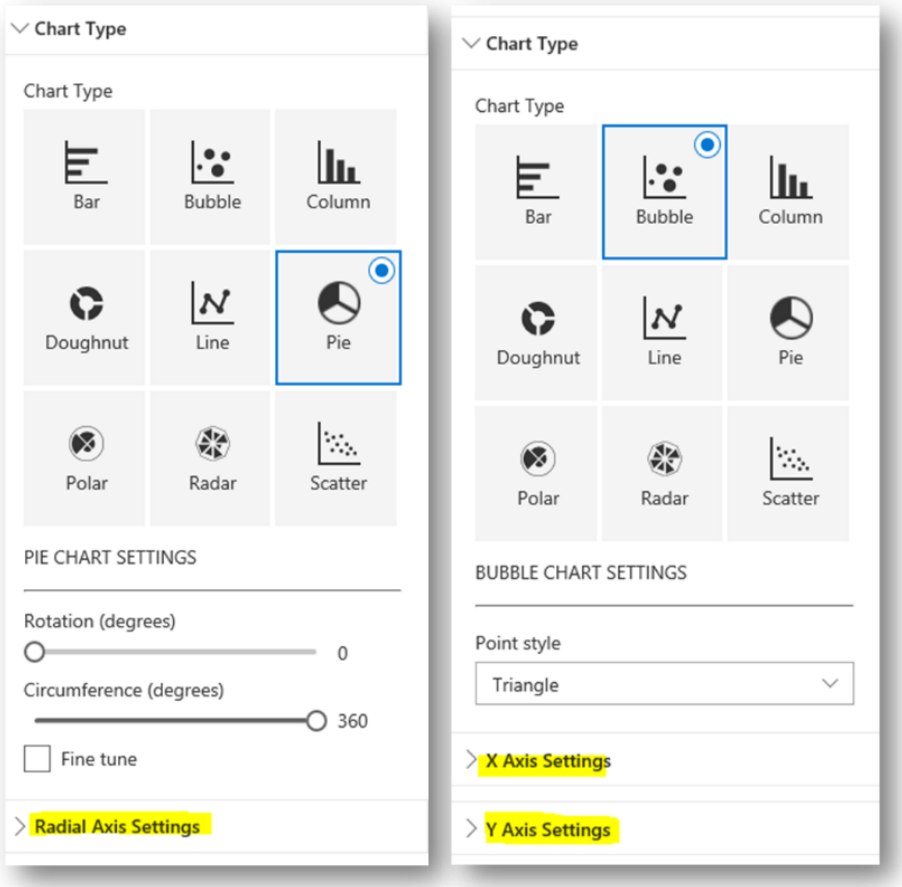
- **Group-by Column Picker**: This control is used to select a **Category** column that will be used to group items returned from the view.
- **Split Multi-Values Checkbox**: This checkbox is only displayed when the column selected in the **Group-by Column Picker** supports multiple values. When checked, and the column value for an item does contain multiple values, the list item will be considered as separate items. So, a SharePoint list item tagged with say the business area Operations and IT will be included in both the Operations and IT chart elements. When not checked, the set of multiple values

will be considered as their own group. The screenshot below shows a Pie Chart which is configured this way. Note that each combined category has a unique legend.[8]

- **Axis Data Column Picker**: Used to select a **Numeric** column for the visualisation. If a group-by column is specified but no data column is selected, then the chart will be based on the number (the Count) of items within each group.
- **Aggregation Function**: This control is only shown when a column has been used to group items and when a **Numeric** column has been specified for use as axis data. The choice of aggregation function will determine how the values in the data column for each group of items are combined into a single data value. The most common aggregation functions are **Sum** (the total of all the values of items in the group) and **Average (Mean)** (the arithmetic mean of values).

Axis Configuration

When a radial chart type is selected (Doughnut, Pie, Polar or Radar), the Radial Axis control group is displayed. For other chart types, two control groups, one each for the X and Y axis are shown, as can be seen from the screenshot below.



The following sub-sections explain the options for configuring each axis.

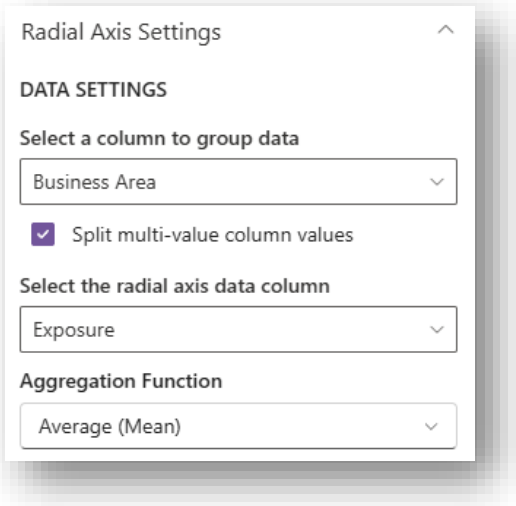
[8] To cut down the permutations of multiple values being in their own unique group, item properties are first ordered alphabetically so the order in which a user happened to apply tags in the SharePoint UI will not result in multiple groups just because items happen to have been tagged in a different order.

Radial Axis Settings

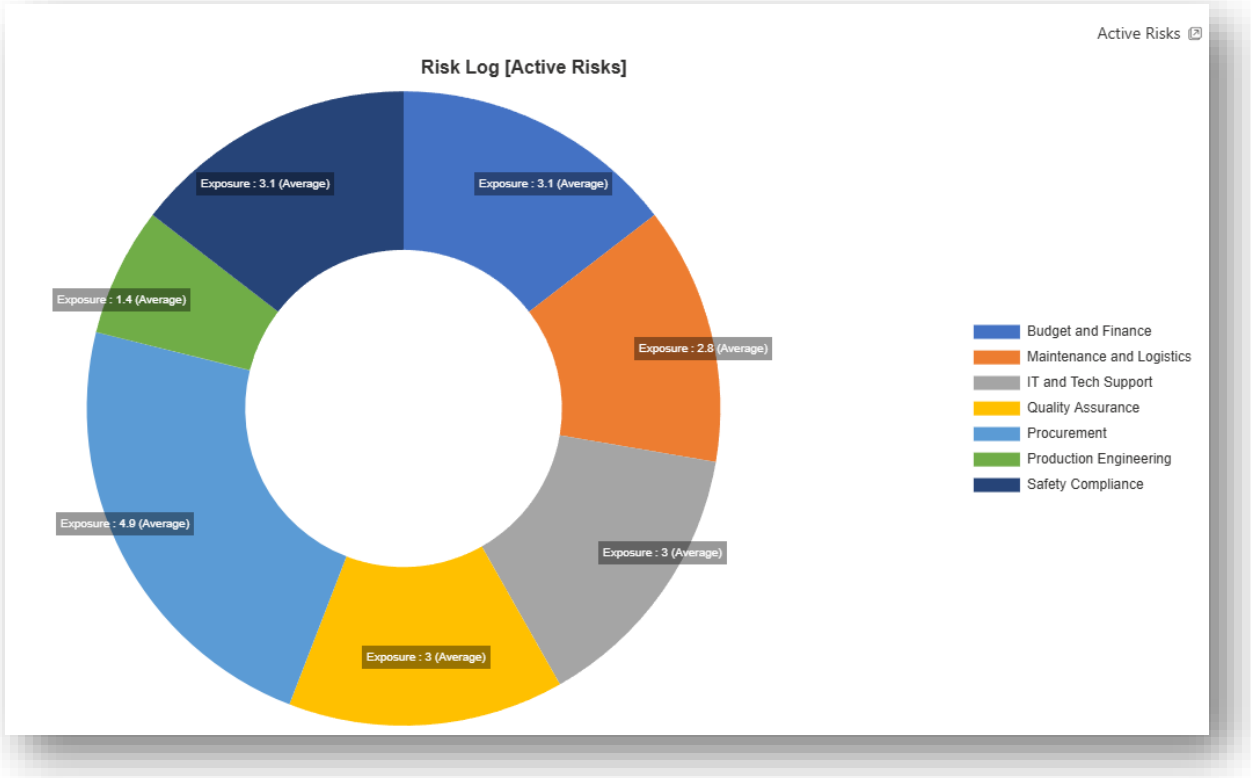
This section describes the use of the controls found in the Radial Axis Settings group of the web part property pane. This control group is only displayed when a radial chart type is selected.

Radial Axis Data Settings

Although the set of controls available in the Radial Axis Settings group differs depending on the specific radial chart type selected, all radial charts share the same set of controls to connect the axis with SharePoint columns, as shown and described in the previous section.



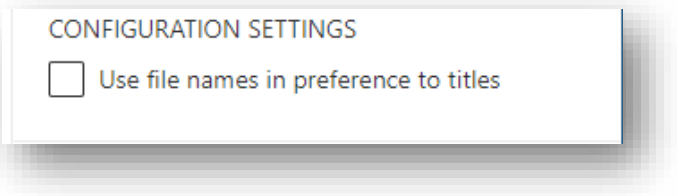
The screenshot below shows a Doughnut chart, grouped by Business Function and configured with the above settings



Configuration Settings for Document Libraries

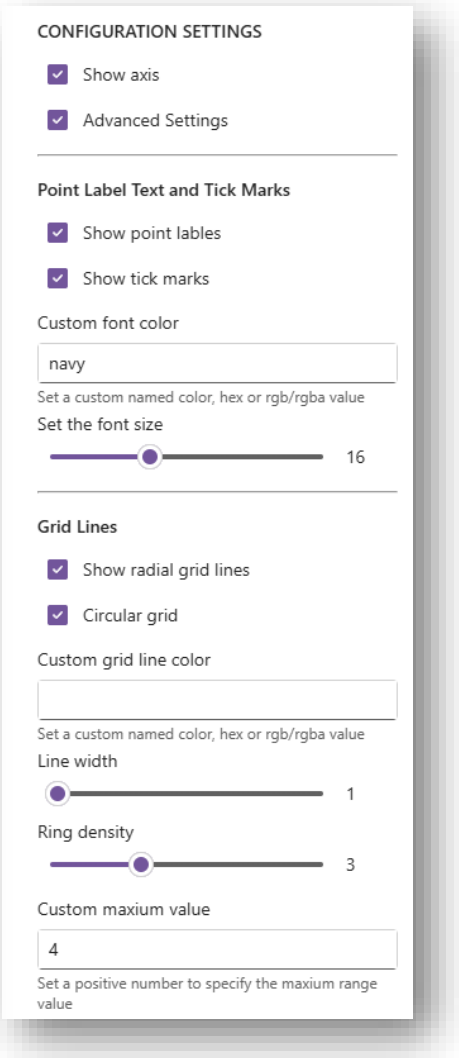
When the web part is connected to a document library a **Use file names in preference to titles** checkbox is displayed. When checked, the web part will display document file names instead of a title value, even if a title has been set on the document.

When not checked, the web part will first look at the title column and use that value if it exists. If a title value is not found the web part will revert to using the document's file name.



Configuration Settings for Polar Area and Radar Chart

When a Polar Area or Radar chart is selected, the Radial Axis Settings group shows a Configuration Settings section which contains several controls that govern if and how elements of the axis are rendered. These configuration settings are not needed for Pie and Doughnut charts.



In the Configuration Settings section, 2 checkbox controls are available:

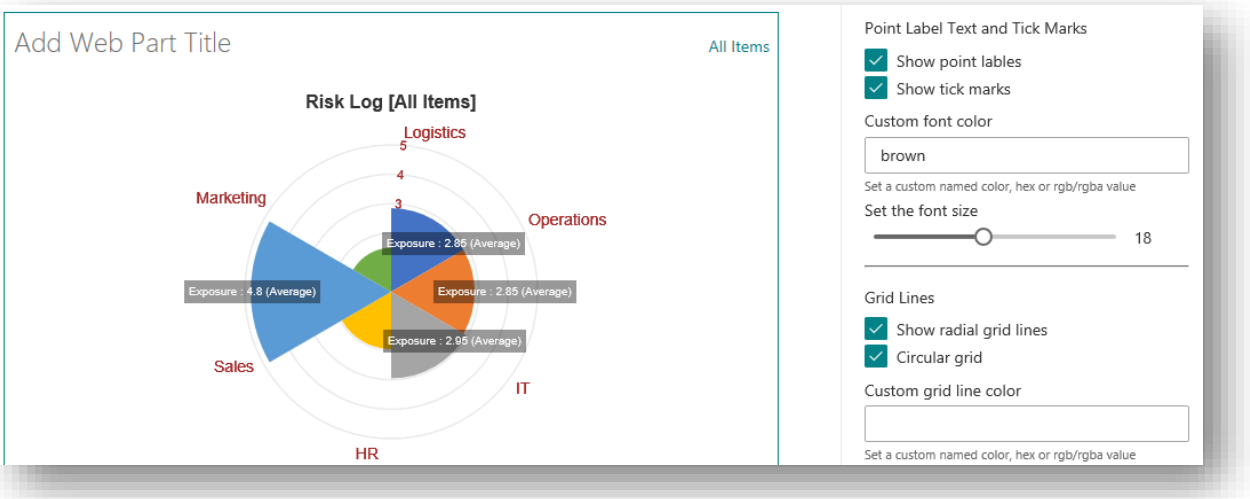
- **Show Axis Checkbox**: When unchecked, no elements of the radial axis are rendered in the chart area, and the **Advanced Settings Checkbox** is hidden.
- **Advanced Settings Checkbox**: When checked, several additional configuration sub-sections and controls are made available

Point Label Text and Tick Marks

The controls in this sub-section are used to configure if and how point labels and tick marks are shown on the radial axis.

- **Show Point Labels Checkbox**: When checked, point labels will be displayed. Point labels are the item title or group name, displayed at the perimeter of the radial axis area.
- **Show Tick Marks Checkbox**: When checked, a numeric tick mark value will be displayed inside the chart area.
- **Custom Font Color Textbox**: This textbox is used to set a custom font color for the point labels and tick marks. This textbox is only enabled if either the **Show Point Labels Checkbox** or the **Show Tick Marks Checkbox** is enabled. If left blank, the point labels and tick marks will use a font color based on the theme used by the SharePoint site.
- **Font Size Slider**: This slider is used to set a custom font size for both the point labels and tick marks if they are shown.

The screenshot below shows a Polar Area chart configured with some custom settings for point labels and tick marks.



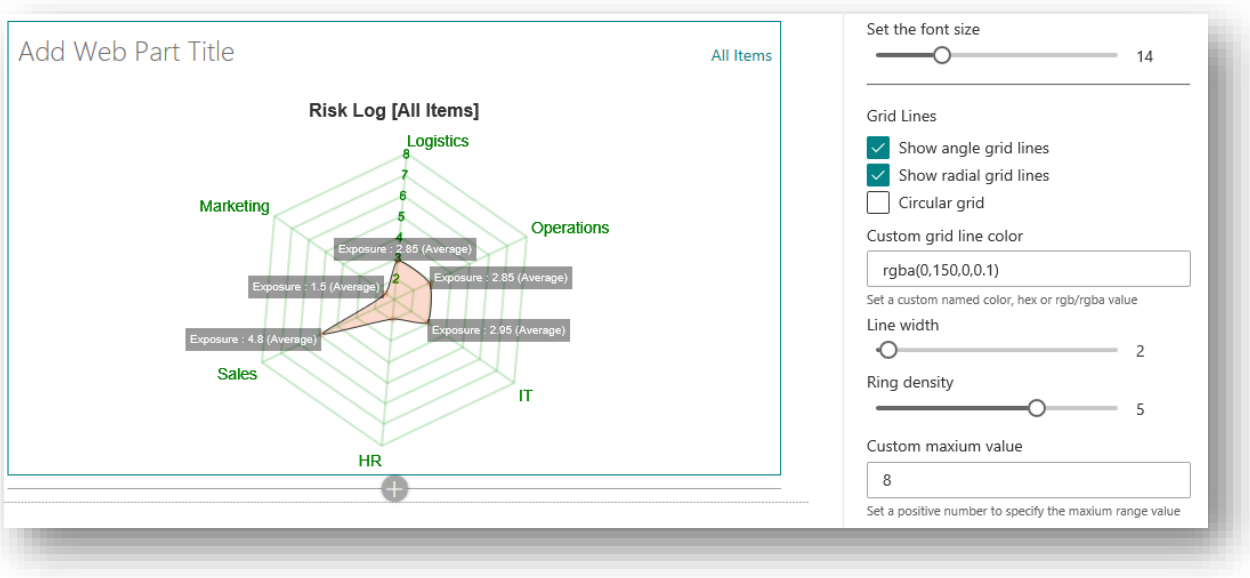
Grid Lines

This sub-section contains controls which govern how grid lines are displayed on the axis:

- **Show Radial Grid Lines Checkbox**: This checkbox is used to control if angle grid line (straight lines radiating from the center of the chart) are shown. Note that this control is only shown for Radar charts as Polar Area charts do not support angle lines.
- **Show Radial Grid Lines Checkbox**: This checkbox is used to control if radial grid lines (the concentric circles radiating from the chart center) are displayed. As the other controls in this sub-group are used to configure grid line settings, they are only displayed when the checkbox is checked.
- **Circular Grid Checkbox**: By default, a Polar Radar will use a circular grid pattern, but you can opt for a linear (spider-web like) grid by un-checking this checkbox.

- **Custom Gird Line Color Textbox**: When a radial grid line is shown, an appropriate theme color will be used by default, but this textbox can be used to set any named color, hex or rgb/rgba color code for the grid lines.
- **Line Width Slider**: Used to set the width of grid lines. By default, grid lines will be a single pixel wide, but the slider can be used to set a value in the range 1 to 20.
- **Ring Density Slider**: Used to set the density of radial grid lines. Note that the value set by the slider is not the number of radial grid lines but the density in which grid lines will appear.
- **Custom Maximum Value Textbox**: This textbox is used to set an upper limit for the radial axis. If this textbox is left blank, the upper limit will be automatically calculated based on the values in the data set.

In the Radar chart below shows the effect of applying some custom settings to controls in the Grid Lines sub-group.



In most cases you will want to leave the Custom Maximum Value textbox empty so that the axis and chart area adapts dynamically to size of the data set. However, if you were setting a page to show a dashboard with multiple web parts, all of which might be showing similar information but from different data sources, you might want to set a fixed maximum value. This way the size of the axis and plot area will be consistent across all web parts so that they can easily be compared without distortion.

X and Y Axis Settings

When a non-radial chart type is selected the Radial Axis control group is hidden and in its place the X and Y axis control groups are displayed.

X and Y Axis Data Settings

The controls shown in both the X Axis Settings and Y Axis Settings groups, used to select **Categorical** (Group by) and **Numeric** (Data value) columns, will depend on the type of chart selected and the configuration of the columns in the source data list in SharePoint, as summarised in the following table, where:

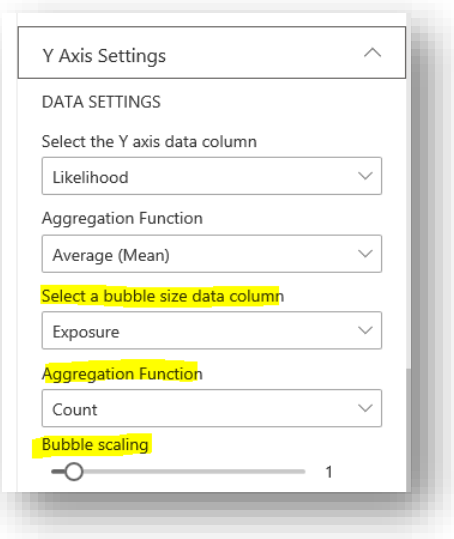
- **Numeric Data Column Picker** controls are used to select **Numeric** columns.
- **Group by Column Picker** controls are used to select **Categorical** columns.

- **Split multi-value column values** checkboxes is used to indicate how items tagged with multiple values are to be processed.
- **Aggregation Function Picker** controls are used to specify how data is to be aggregated when items are grouped.

Chart Type	X-Axis	Y-Axis
Bar	— Numeric Data Column Picker — Aggregation Function Picker (when grouped in the Y axis)	— Group by Column Picker — Split multi-value column values checkbox (when the selected group by column supports multiple values)
Column	— Group by Column Picker — Split multi-value column values checkbox (when the selected group by column supports multiple values)	— Numeric Data Column Picker — Aggregation Function Picker (when grouped in the X axis)
Line	— Group by Column Picker — Split multi-value column values checkbox (when the selected group by column supports multiple values)	— Numeric Data Column Picker — Aggregation Function Picker (when grouped in the X axis)
Scatter	— Group by Column Picker — Split multi-value column values checkbox (when the selected group by column supports multiple values) — Numeric Data Column Picker (for the x axis) — Aggregation Function Picker (when grouped in the X axis)	— Numeric Data Column Picker (for the y axis) — Aggregation Function Picker (when grouped in the X axis)
Bubble	— Group by Column Picker — Split multi-value column values checkbox (when the selected group by column supports multiple values) — Numeric Data Column Picker (for the x axis) — Aggregation Function Picker (when grouped in the X axis)	— Numeric Data Column Picker (for the y axis) — Aggregation Function Picker (when grouped in the X axis) — Numeric Data Column Picker (for the r axis – for the radius of bubbles) — Aggregation Function Picker (when grouped in the X axis and a numeric data column is selected for the r axis) — Bubble Scaling Slider (when a numeric data column has been selected for the r axis)

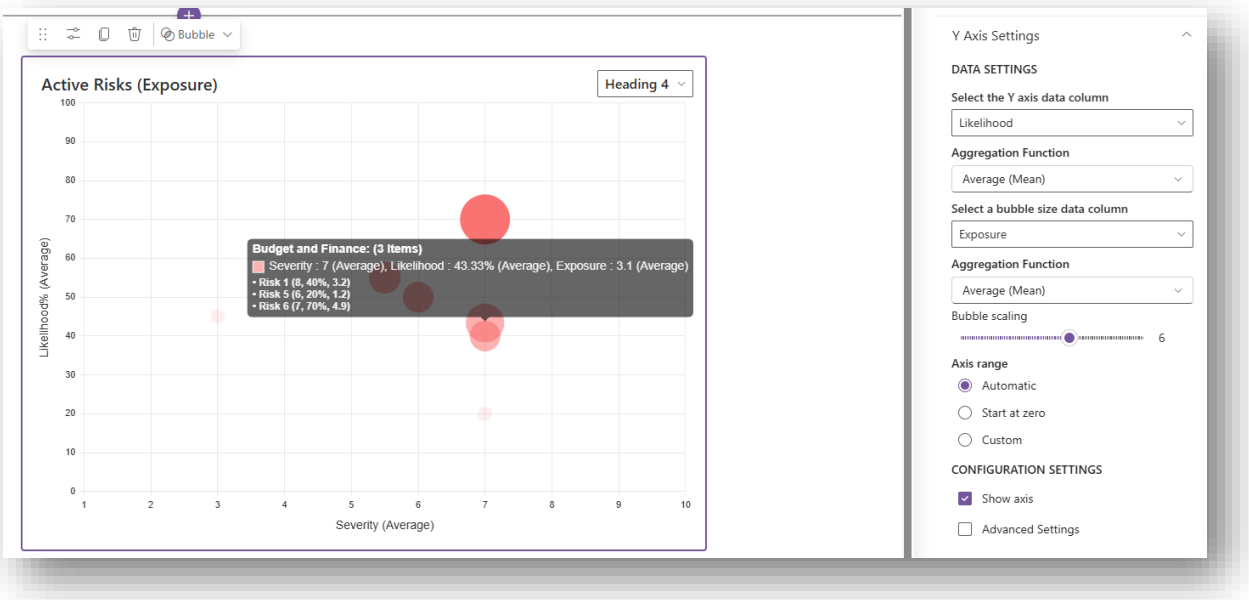
Bubble Chart Scaling

With a Bubble Chart, a tertiary set of data values can be specified and used to set the size of each data point or the radius of each bubble when a circle data point is used. Bubble Charts provide up to 3 additional controls in the Y Axis Settings group:



- **Bubble Size Data Column Picker**: This is used to select a column that will provide the tertiary data column to control the size of the bubble (usually the radius).
- **Bubble Aggregation Picker**: This control is used to specify the aggregation function to be applied to the tertiary data set. This control is only shown if the data is grouped.
- **Bubble Scaling Slider**: This control can used to scale the bubble size so to show the difference between values in a more marked way. This control is only shown when a valid bubble data column has been selected to specify the tertiary data set.

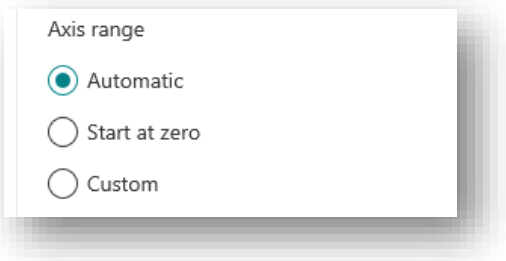
The Bubble Chart below is grouped by Business Area (on the X axis) and uses the Average of Exposure column values to generate the bubble size where the average of the Severity Value and Likelihood values are used on the X and Y axis, respectively.



A bubble scaling value of 6 is set so that differences between bubbles is more pronounced. Note that bubbles are for indicative purposes only and the data that is used to drive their size is applied to the radius of the bubble and not the bubble's area.

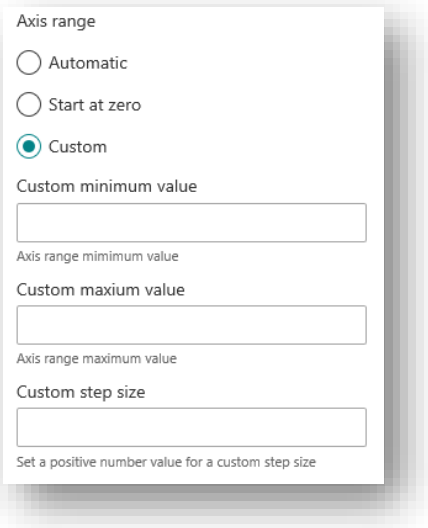
Axis Range Controls

Whenever setting a numeric data column for an X or Y axis, the **Axis Range Choice Group** control is also made available:



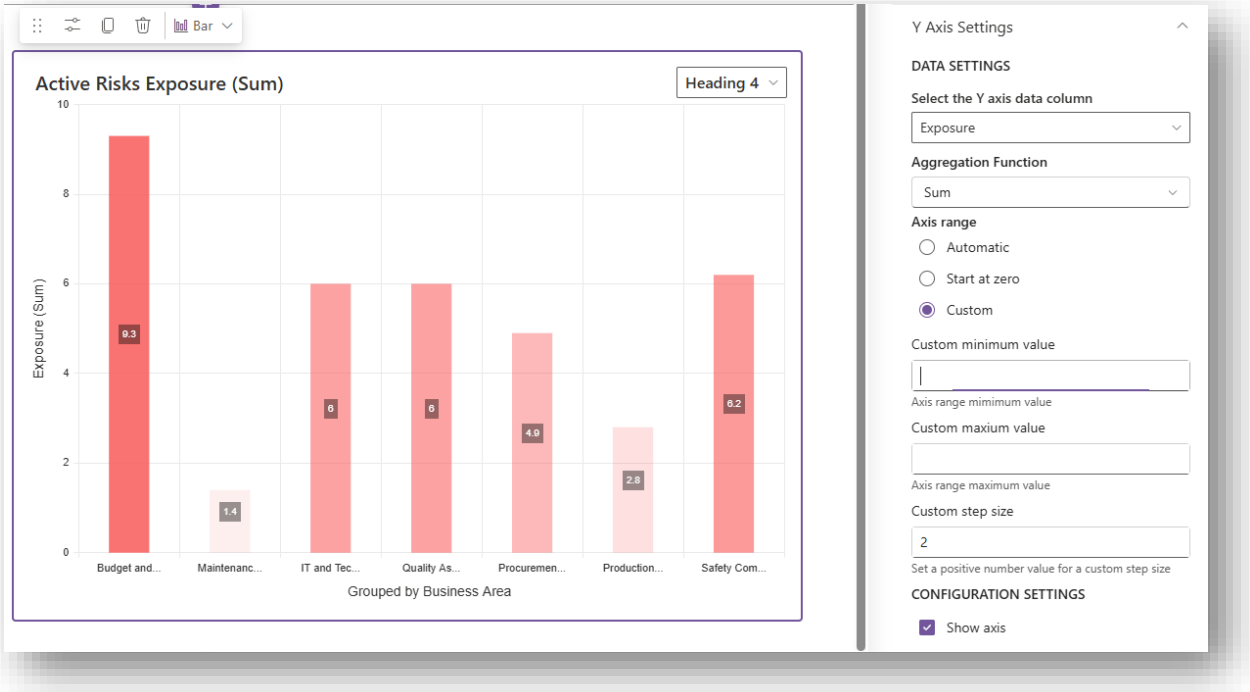
Axis Range Choice Group is used to set the mode for the axis range of values, and can be set to one of the following values:

- **Automatic**: The axis range is determined automatically based on the set of values in the data set.
- **Start at zero**: This option forces the axis to start at zero but values for axis range maximum and step size will be automatically calculated.
- **Custom**: A custom range can be applied to the axis. When Custom mode is selected the following 3 additional controls will be displayed:



  - **Minimum Range Value Textbox**: Can be used to specify the minimum value to be shown on the axis.
  - **Maximum Range Value Textbox**: Can be used to specify the maximum value to be shown on the axis.
  - **Custom Step Size Textbox**: Can be used to specify a custom step size, which is the interval between grid lines and/or tick marks shown on the axis.

If you select the **Custom** option for the axis range, values do not necessarily need to be applied to all the other textbox controls. If a value is not set (left blank) then the corresponding **Automatic** mode value will be used by default. For example, if you just wanted to change the **Step** value to say 2 but leave the maximum and minimum values at their default settings then you would only need to set the value 2, in the **Custom Step Size Textbox**, as shown in the screenshot below.



When setting custom range values in Line, Scatter and Bubble charts, be aware that if a chart element (data point or bubble) lies outside of the specified range, it will not be shown in the chart area.

Similarly, for other chart types, elements which would usually extend beyond the specified custom range settings for the axis, will be cut off.

The screenshot below uses the same data set as above, but this time the maximum value for the axis has been set at 3.

Although the chart element labels show values higher than 3 for all items other than the Maintenance and Logistics and the Production Engineering groups, the chart is misleading, as a quick glance would suggest that the total risk exposure is the same across all other business areas of the business when the previous screenshot clearly shows that this is not the case.

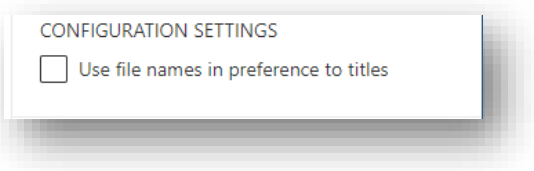
Consequently, care should be taken when manually setting axis range values as the values specified are statically set as web part properties and whilst these values may be fine when initially configured, they may not be fine if the data set is updated subsequently and so may contain unexpected outlier values.

For this reason, we recommend leaving the axis in the default, Automatic mode, unless you have a good reason not to.

X and Y Axis Configuration Settings

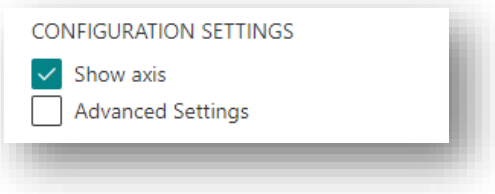
In addition to providing controls, used to configure the data for each axis, the X and Y axis control groups also provide Configuration Setting controls which govern other aspects of how each axis is rendered.

As with radial charts, when a web part is connected to a document library a **Use file names in preference to titles** checkbox is displayed.



When checked, the web part will use a document's file name in preference to a title value, even if a title value has been set.

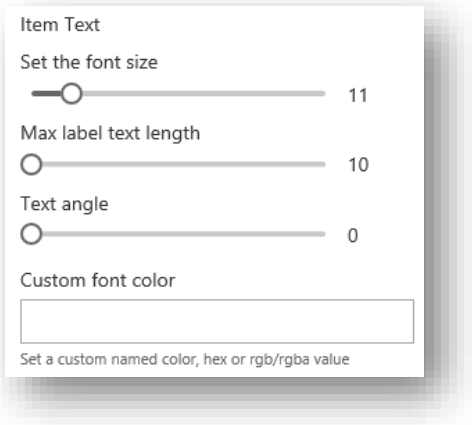
The **Show Axis Checkbox** control is used to determine if the axis is shown or hidden.



When the **Show Axis Checkbox** is checked the **Advanced Settings Checkbox** will be displayed.

When the **Advanced Settings Checkbox** is checked several additional controls, grouped into sub-sections, are shown and can be used to format different aspects of the axis, as detailed below:

Item Text

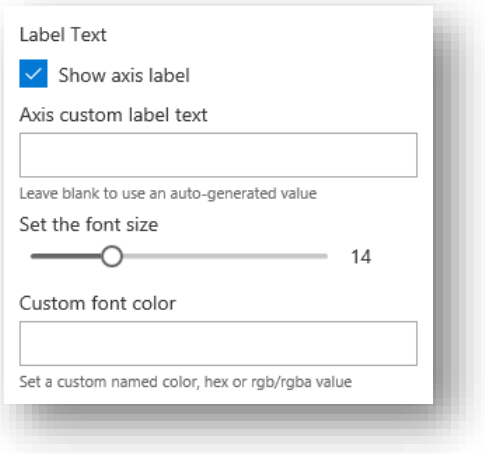


The controls in the Item Text sub-section, are used to govern how the labels for each chart item are displayed on the axis, as follows:

- **Font Size Slider**: Used to control the font size and can be set to a value in the range 8 to 30.
- **Max Label Text Length Slider**: Used to control the maximum number of characters to be displayed before the axis label is truncated.
- **Text Angle Slider**: Used to control the angle of axis labels in the range 0 to 90 degrees.
- **Custom Font Color Textbox**: Used to set a custom color to use for axis labels.

The screenshot below shows a chart where the X axis labels have been displayed using a font size 14, set to a custom angle of 30^0 and displayed in a custom font color (navy).

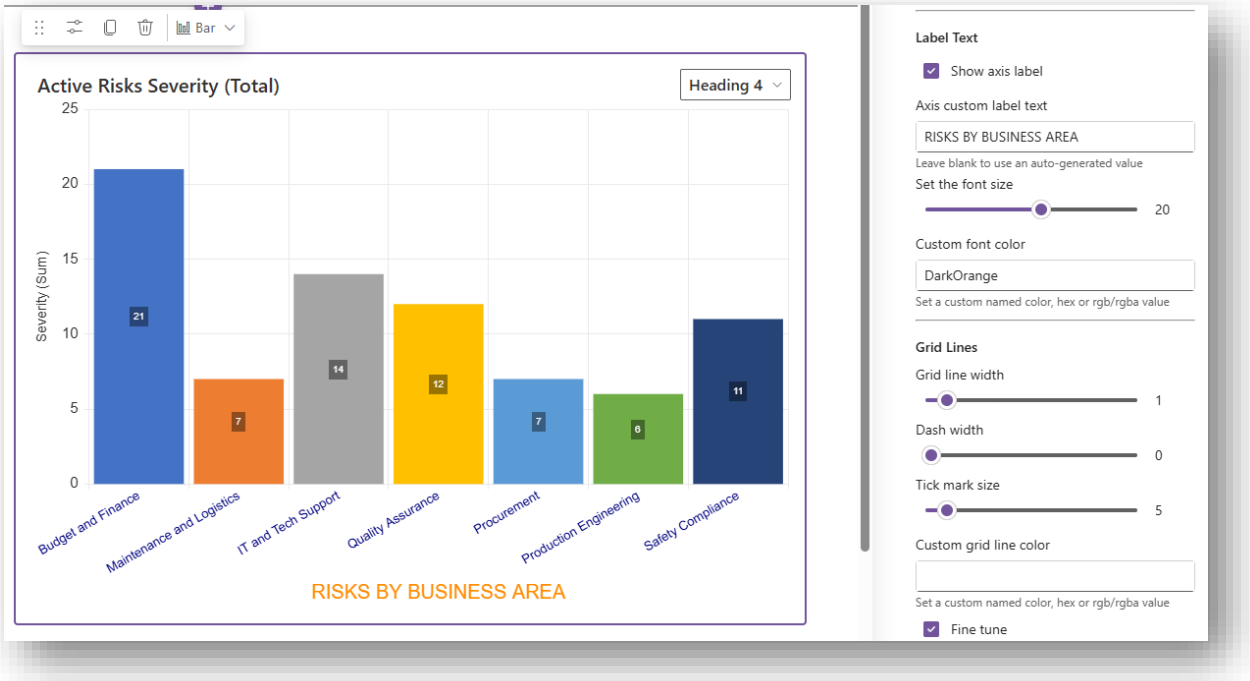
Label Text



The label text collection of controls governs if, and how, an axis label is added to the chart.

- **Show Axis Label Checkbox**: When checked an axis label is shown. If not checked no label for the axis is rendered and the other controls in the label text section are hidden.
- **Custom Axis Label Textbox**: By default, K-Charts will add an automatically generated axis label text based on how the web part is configured.
- **Label Text Font Size**: Used to set the font size of the axis label in the range 8 to 30.
- **Custom Font Color Textbox**: Used to set a custom font color of the axis label.

The screenshot below shows the X axis of a chart configured with customised values.



When configuring a web part, it is usual for many different settings to be tried out to determine what configuration best suits your purpose. This often means trying out different columns for data, data aggregation and grouping, and maybe selecting a different chart type altogether.

The automatically generated axis label is based on the following:

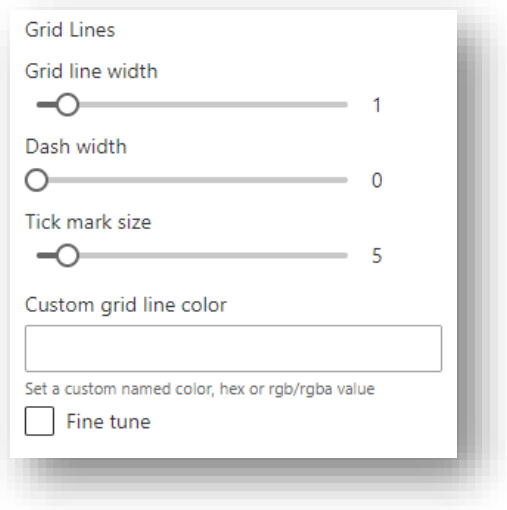
- The data column or grouping selected for use with the axis.
- The data aggregation method specified when the axis data column is grouped.
- Any custom sort ordering which may have been applied.
- How numeric columns used for the axis are configured in the SharePoint list or library, specifically:
    - A % symbol will be added to the label when the selected axis column has been configured to show data as a percentage.
    - The relevant currency symbol will be added when the axis column is a currency column type.

Where the data is grouped, the % or currency symbol is only shown when it makes sense to do so for the selected aggregation function. For example, if the aggregation function is Sum or Average then it makes sense to show these symbols, but it makes no sense to do so when the aggregation function is Count.

If you set a custom axis label value, then it is likely that you will need to update that axis label text to reflect changes made in the web part configuration. It is very easy to forget to update a static label value which might no longer reflect how the web part is configured resulting in confusion for end users.

For that reason, we recommend using the automatically generated axis label, at least until such time that experimentation with different axis settings is over.

Grid Lines

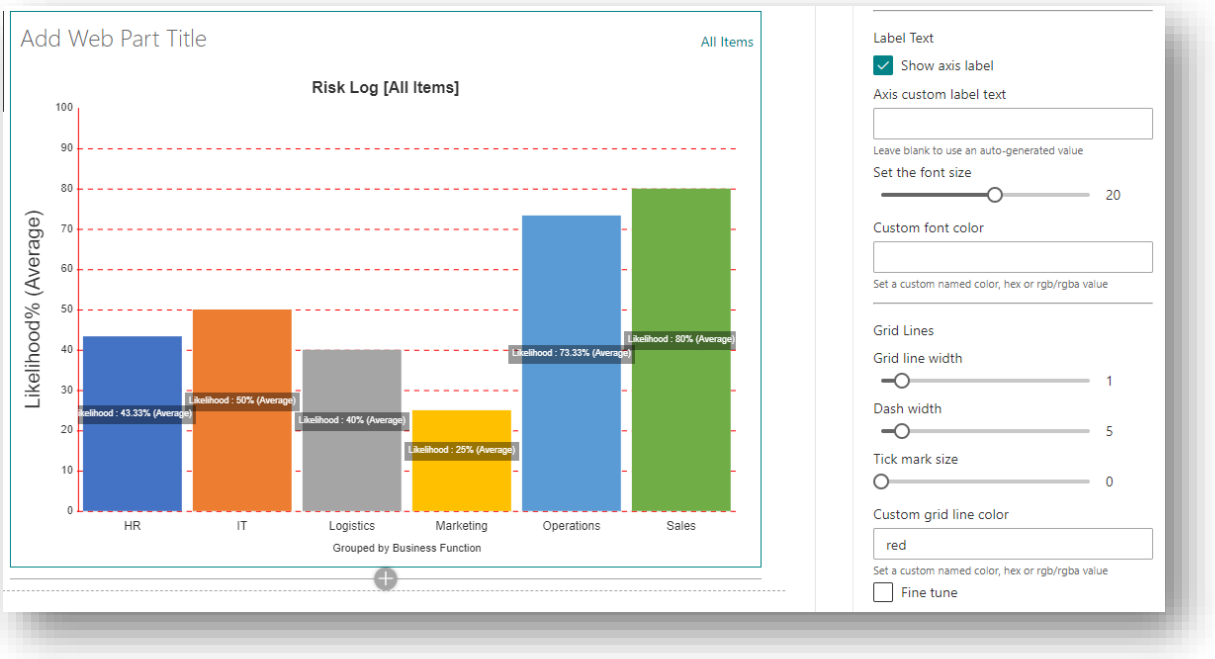


The Grid Line controls are used to configure if, and how, axis grid lines are displayed:

- **Grid Line Width Slider**: Used to set the width of the axis grid line in pixels. Values in the range zero to 10 are accepted. If a value of zero is set, the gridlines will be hidden and the other controls in this section will be disabled.
- **Dash Width Slider**: Used to set the dashed line style of the grid line. The dash line width can be set in the range zero (a solid line) to 50 (line dash segments and spaces will be 50px).
- **Tick Mark Size**: Controls if, and the extent to which, tick marks extend beyond the axis baseline. By default, the tick mark will extend 5 pixels beyond the baseline, but this control allows that to be adjusted in the range 0 to 50px. A value of zero will mean that the grid line touches the baseline but does not extend beyond it.

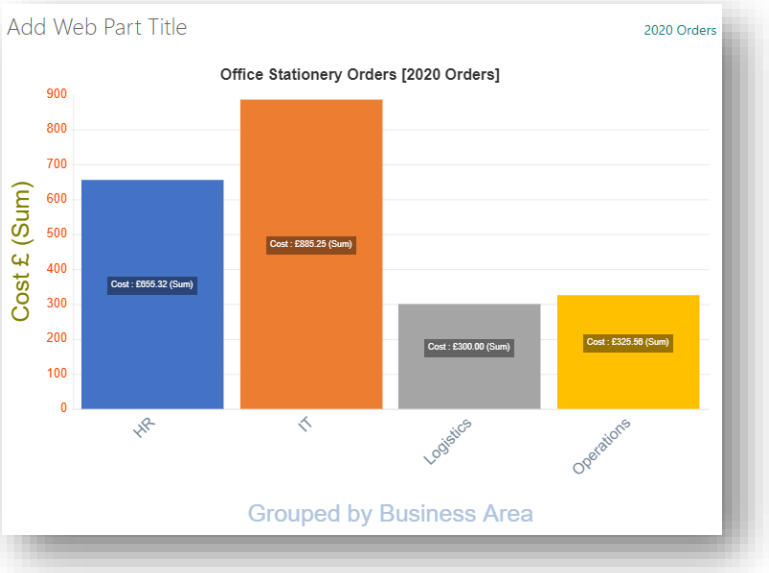
- **Custom Grid Line Color Textbox**: Used to set a custom color for the grid line.

The screenshot below shows a custom configuration for grid lines on the chart's Y Axis, with the X axis grid lines hidden.



Notice also, how the Y Axis has been set to use a numeric column that has been configured in SharePoint, to show values as a percentage and the data is grouped (by business function) using the Average aggregation function. As such, the selected column, the % symbol and aggregation function are all used to construct the automatically generated Y axis label.

The following screenshot is of a K-Chart web part which is linked to a different list, the Office Stationery Orders list. This list is a simple data structure that records the procurement cost of stationery orders by Business Area.

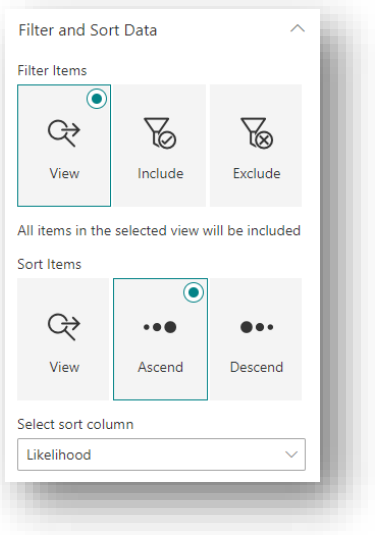


In this case, the axis labels and item text have been configured to use different font sizes, angles and colors. We make no judgement on the aesthetics of such a configuration but rather use it simply as a vehicle to demonstrate what is possible.

Notice how the automatically generated X axis label indicates that the chart items (columns in this case) are grouped by the Business Area column and that the Y axis label (also automatically generated) indicates that the Cost column is used.

As the Cost column is a currency column, configured to use UK Pounds, the £ symbol has been added to the Y axis label. Similar, because the data is grouped, and the Sum aggregation function has been selected, that information is also included in the default axis label.

Filter Data/Filter and Sort Data



As Scatter and Bubble charts plot data items based on values in both the X and Y axis, then it makes no sense for these items to be sorted as their position is determined by x and y coordinate values. For that reason, the group title is set to “Filter Data” whenever a Scatter or Bubble chart is specified and the Sort Items controls are hidden.

For all other chart types, custom sorting can be applied and so the title of the section is set to “Filter and Sort Data” and the sort controls are available.

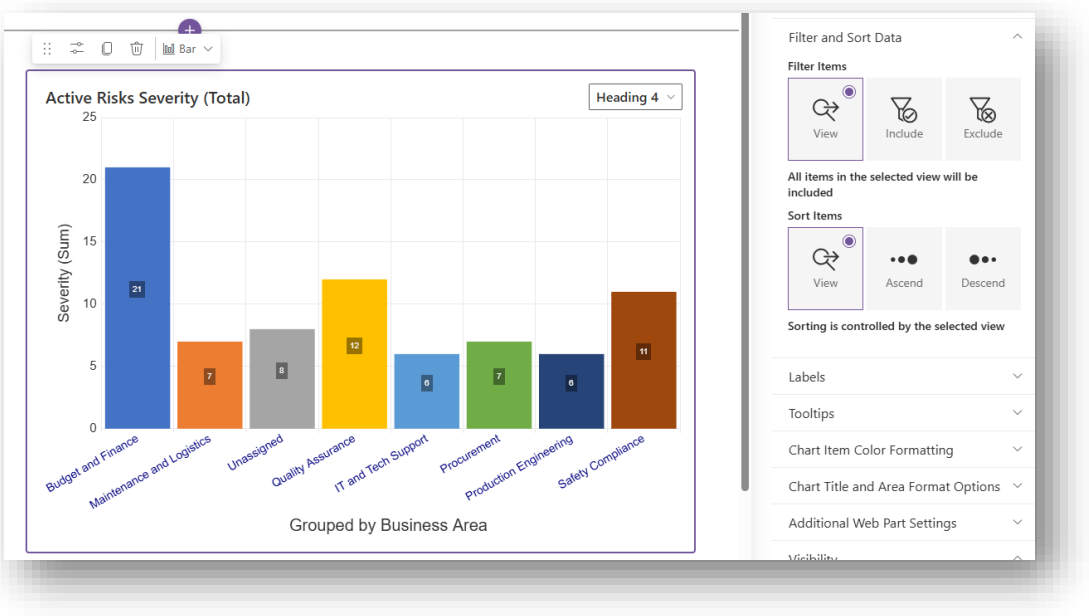
This group of controls are optionally used to provide additional item filter and/or sort options.

Filter Items

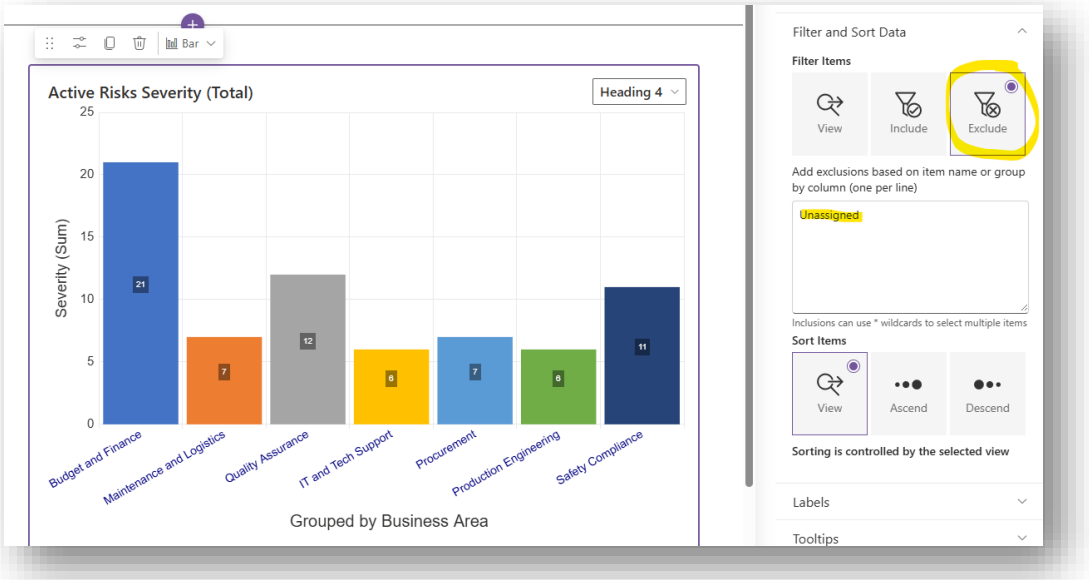
The **Filter Item Choice Picker** control is used to set the filter mode and can be set to one of the following values:

- **View**: This is the default setting and means that all items returned by the selected view will used in the visualisation.
- **Include**: This mode is used to explicitly include a sub-set of items or groups and to apply a custom sort order on those included items.
- **Exclude**: This mode is used to explicitly exclude items from the chart.

In the chart below, risks are grouped by Business Area, and the Filter Mode is set to View, which means that all items returned by the selected view are included in the chart.

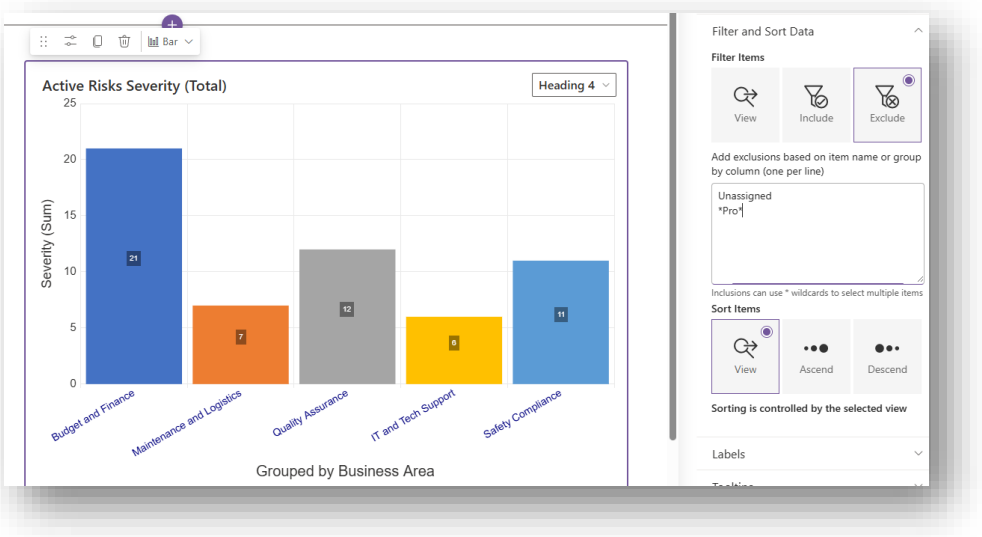


The above screenshot shows that the list contains risks not assigned to any Business Area and so are swept into the "Unassigned" category but suppose we wanted to exclude all unassigned items from the chart. To do this, select the **Exclude** option from the **Filter Item Choice Picker** and simply type the name of the item to be excluded into the exclusion text box.

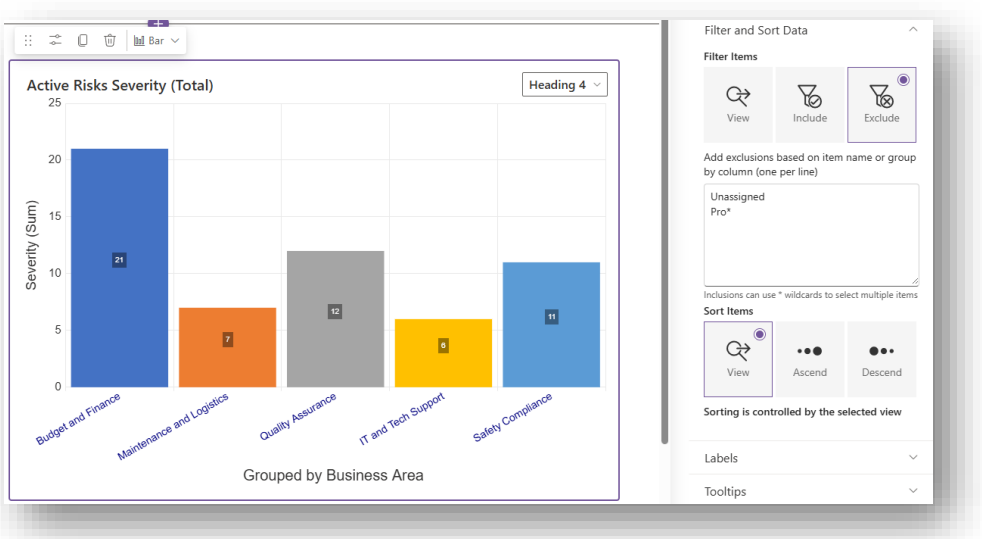


Note that the text is matched exactly to the name of the chart item and is case sensitive. To exclude multiple items simply add new text values with each item on a new line.

It is also possible to use * wildcards to match to potentially match with multiple items. In the screenshot below, the chart has been filtered to exclude groups that contain 'Pro'.



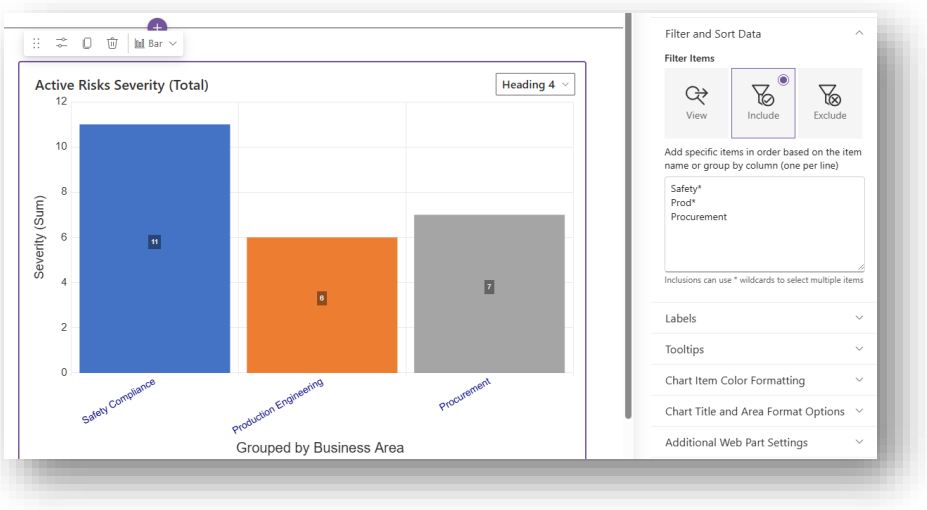
This pattern matches with the groups for Procurement and Production Engineering and so they are excluded from the chart.



You can use the * wildcard before and/or after the text filter value to match on:

- **Begins with**: Leading *
- **Ends with**: Trailing *
- **Contains**: Both a leading and trailing *
- **Equals**: Exact text match

Rather than excluding items it is sometimes more convenient to explicitly include items from the chart. In the screenshot below, the **Filter Item Choice Picker** has been set to **Include** mode and this time the chart has been configured to return just items in the Procurement, Production Engineering and Safety Compliance areas.



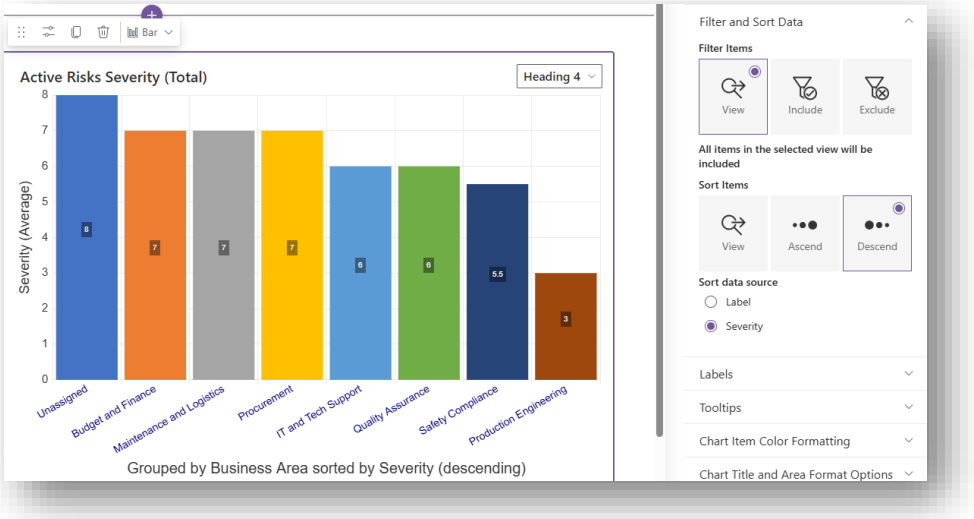
Sort Items

The **Sort Items Choice Picker** control is only shown when the filter mode is set to **View** or **Exclude**. When the filter mode is set to **Include**, the order in which the included terms are entered into the textbox will determine the sort order.

When the filter mode is set to either **View** or **Exclude**, the **Sort Items Choice Picker** control is displayed and is used to set the Sort Mode value. The Sort Mode is set to one of the 3 following values:

- **View**: The order is determined by the selected view. In the case of grouped items, the order is set alphabetically based on the alphabetically-first item in the group.
- **Ascend**: The sort order is ascending.
- **Descend**: The sort order is descending.

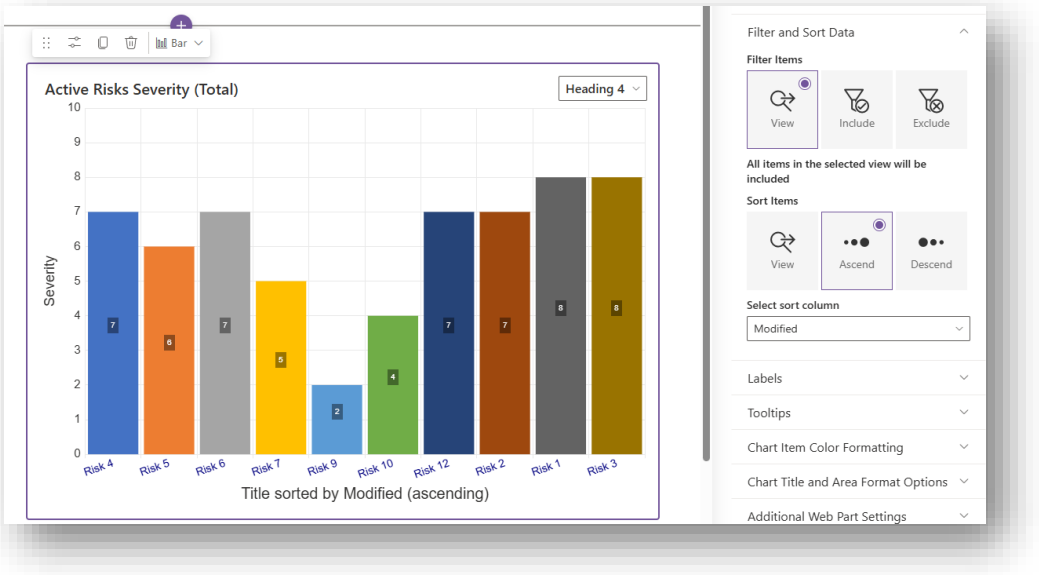
There may be other controls displayed beneath the **Sort Items Choice Picker** control depending on how the web part is configured. If the chart is not grouped, then the **Sort Column Picker** control will be displayed and will enable you to select a column to determine the sort order. In the screenshot below, risk items are grouped by Business Area and presented in descending order based on their average Severity value.



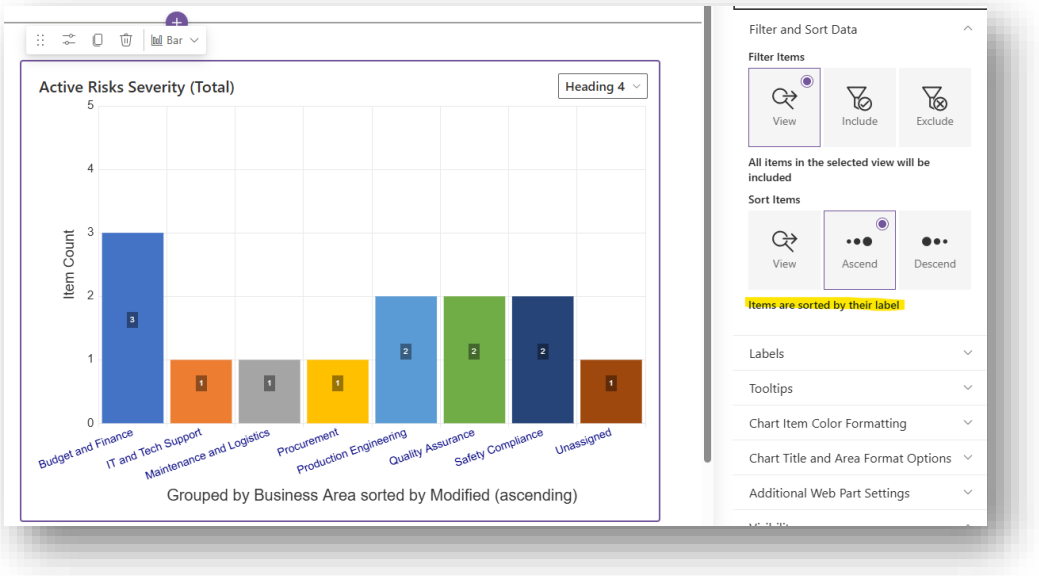
Where items have the same value, they will be ordered alphabetically within that cohort (regardless of whether the sort mode is ascending or descending).

In the above screenshot, the selected sort order column is the same as the primary data column (on the Y axis for a Column chart) and so items will be nicely arranged such that chart items will descend from larger values to smaller ones (in this case).

However, it is entirely possible to pick a sort order column that is different to the that of a data axis. Below, you will see a chart time ordered by the Modified date/time value.



When the Sort Mode is set to either Ascend or Descend and a **Numeric** data column has not been set the order is determined alphabetically (ascending or descending) based on the item title or the group name if the chart data is grouped as can be seen in the example screenshot below:

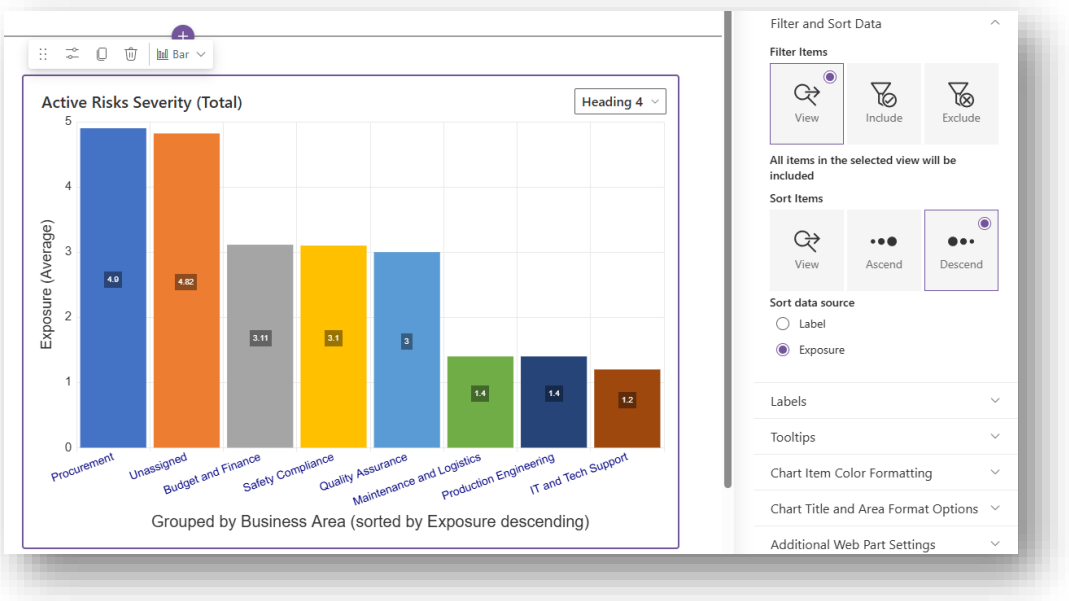


When a numeric data column has been assigned to the primary axis (the X axis in Line and Column charts, the Y axis in Bar charts and the R axis in radial charts) and items have been grouped, you can

choose to order the items by either their label or by the value in the primary axis, which will be the value returned by the selected aggregation function applied to items in each group

In cases where items return the same value, secondary ordering will be based alphabetically on the item title or group name.

The screenshot below shows the same set of grouped items but now sorted by their average Exposure value in descending order.



In summary:

- Sorting items is not relevant for Scatter and Bubble charts as these chart types plot items in a Cartesian plane using 2 data sets for the X and Y axes.
- For all other chart types, by default items are sorted in the order they are returned by the list view used by the web part. When items are grouped, the group order is determined by the first item assigned to each group.
- You can choose to change the default sort order by switching the Sort Mode to either Ascending or Descending but the controls available to sort items depends on whether the items are grouped or not.
- When items are not grouped:
    - You can select a **Numeric** or **Categorical** column from the list to specify the sort order.
    - When a **Numeric** column is selected the column value will be used to sort items.
    - When a **Categorical** column is selected, chart items will be ordered alphabetically based on the category value.
    - When items have the same numeric or category value, they will be ordered in ascending order based on their title value.
- When items are grouped:
    - Items can be sorted alphabetically using the label value of the chart item (the group name) or by the primary data set if one has been specified in the relevant data axis.
    - Where no primary data set has been specified, chart items can only be sorted by their group name.

- Where a primary data set has been specified, chart items can be sorted based on the value of the group which is determined by applying the specified aggregation function to the data values within each group.
- If chart group items share the same value, they are then ordered in ascending or descending alphabetical order, depending on the selected sort mode.

Labels

This group of controls govern how chart labels are displayed.

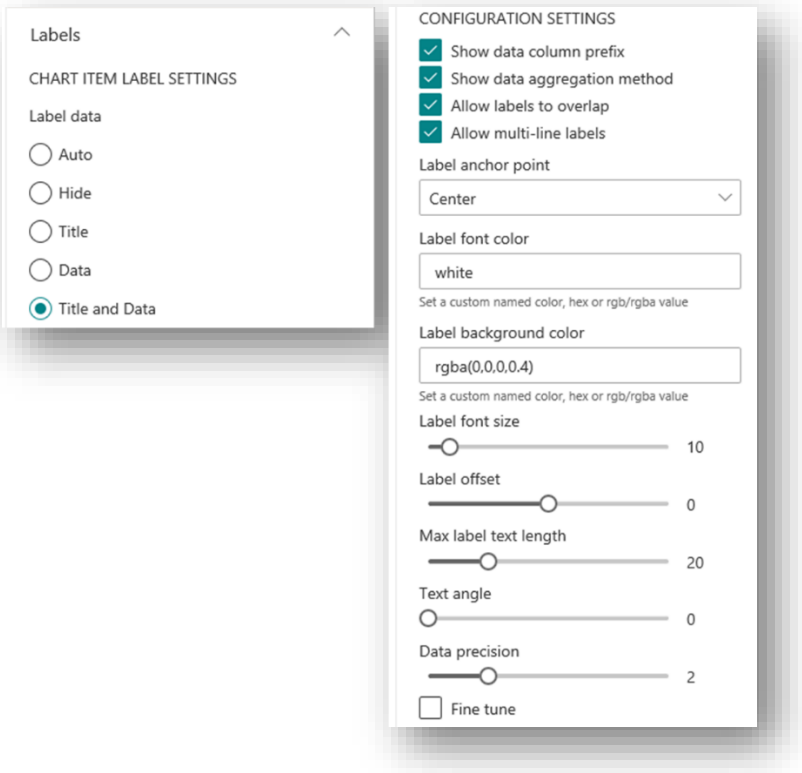


Chart Item Label Settings

This sub-section contains just the **Label Data Choice Picker**: This control is used to select the Label Data Mode and will be set to one of the following values:

- **Auto**: Label data is automatically configured based on chart type, layout and other settings applied in the web part.
- **Hide**: No label data information is displayed. When the label data mode is set to Hide, all other label data controls are hidden in the property pane.
- **Title**: Only the item title or group-by name is displayed on the chart item.
- **Data**: Only data values are displayed on the chart item.
- **Title and Data**: Both the item title/group name and the data values are displayed.

Configuration Settings

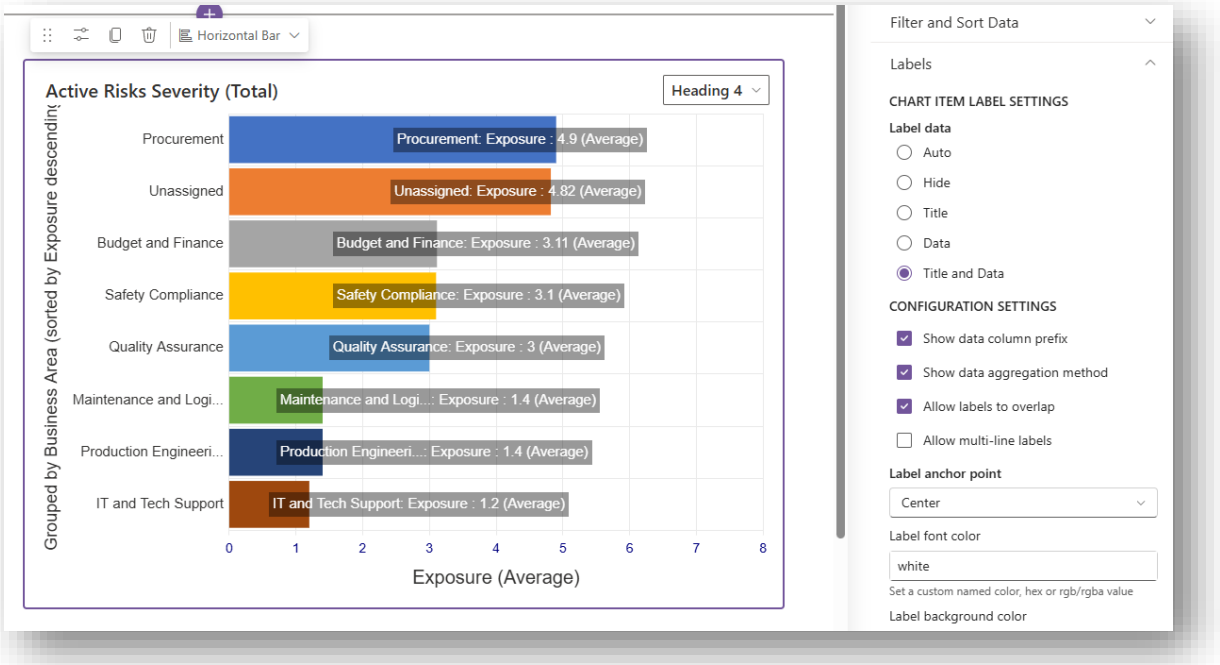
The controls available in this sub-section will vary depending on the selected Label Data Mode.

- **Show Data Column Prefix Checkbox**: This checkbox is only shown when the Label Data Mode is set to either **Data** or **Title and Data**. When checked the name of the data column will be used in the label data as a prefix to the data value itself.
- **Show Data Aggregation Method Checkbox**: This checkbox is only shown when the chart data is grouped, and the Label Data Mode is set to either **Data** or **Title and Data**. When checked,

the aggregation function used for grouped items will be shown in brackets as a suffix to the data value.

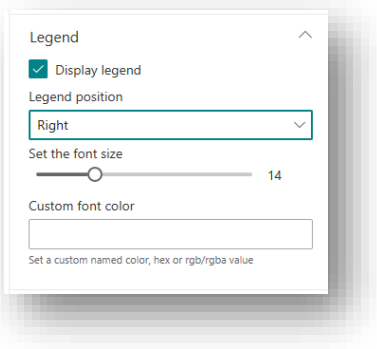
- **Allow Labels to Overlap Checkbox**: This checkbox is only shown when the Label Data Mode is set to either **Title** or **Title and Data**. The chart area can get crowed and it can look messy if too many overlapping labels are shown. When this control is checked any overlapping labels will be hidden.
- **Allow Multi-Line Labels Checkbox**: Again, this checkbox is only shown when the Label Data Mode is set to either **Title** or **Title and Data**. When checked, labels may be split over multiple lines, for example the title might be shown on one line and the data value shown beneath. When unchecked, the label will be displayed as a single line of text.
- **Label Anchor Point Picker**: Used to set the anchor point for the label and can be set to one of the following values:
  - **Center**: The label will be anchored in the center/middle of the chart item
  - **Start**: The label will be anchored to the start/bottom of the chart item
  - **End**: The label will be anchored to the top/end of the chart item.
- **Label Font Color Textbox**: Used to set the font color used for label data items.
- **Label Background Color Textbox**: Used to set the background color for label data items.
- **Label Font Size Slider**: Used to set the font size of label data items in the range 8-30.
- **Label Offset Slider**: Used to set a positive or negative offset from the selected anchor point for label data items.
- **Max Label Text Length Slider**: Used to set the maximum number or characters that can be displayed on a label data item before the text is truncated.
- **Text Angle Slider**: Used to set a custom angle of the label data text.
- **Data Precision Slider**: Used to set precision of numeric data values. By default, the precision is set to 2 decimal places but must be set to a value in the range 0 to 8.

The screenshot below shows a Bar chart with some custom settings applied.



Legend

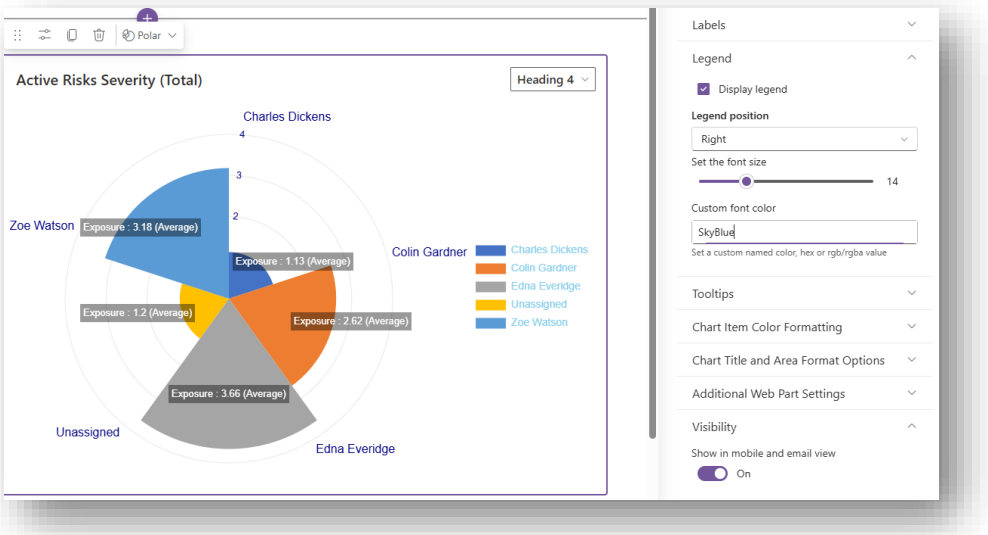
Legends are currently only available for Radial chart types and so the Legend control group is only display when a Radial chart type has been selected.



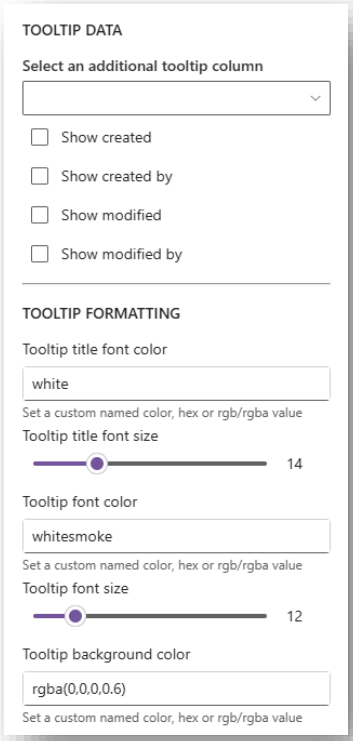
The Legend control group contain the following controls:

- **Display Legend Checkbox**: When checked a chart legend will be displayed. When not checked, no legend will be displayed and all the other controls in the group will be disabled.
- **Legend Position Picker**: Used to indicate where in the web part area the legend will be displayed and can be set to one of the following values:
  - **Top**: The legend will be displayed across the top of the chart area but below the chart title (assuming the chart title is configured to be displayed at the top) and web part title.
  - **Bottom**: The legend will be displayed across the bottom of the chart area but above where the chart title would be if configured to be displayed at the bottom.
  - **Left**: The legend is shown to the left of the chart area.
  - **Right**: The legend is shown to the right of the chart area.
- **Legend Font Size Slider**: Used to control the font size of the legend text and can be set in the range 8 to 30.
- **Legend Custom Font Color Textbox**: Used to set a custom font color that can be applied to the legend text.

The screenshot below shows the legend of a Polar Area chart, with some custom settings applied.



Tooltips



Tooltips can be configured to display additional information when a user hovers their mouse/pointer over a chart item.

The Tooltips group has 2 checkboxes:

- **Show Tooltips Checkbox**: When checked, the chart will be configured to display tooltips, and the Tooltips Advanced Settings checkbox has been displayed.
- **Tooltips Advanced Setting Checkbox**: When checked additional controls are displayed which allow for a detailed configuration of tooltips.

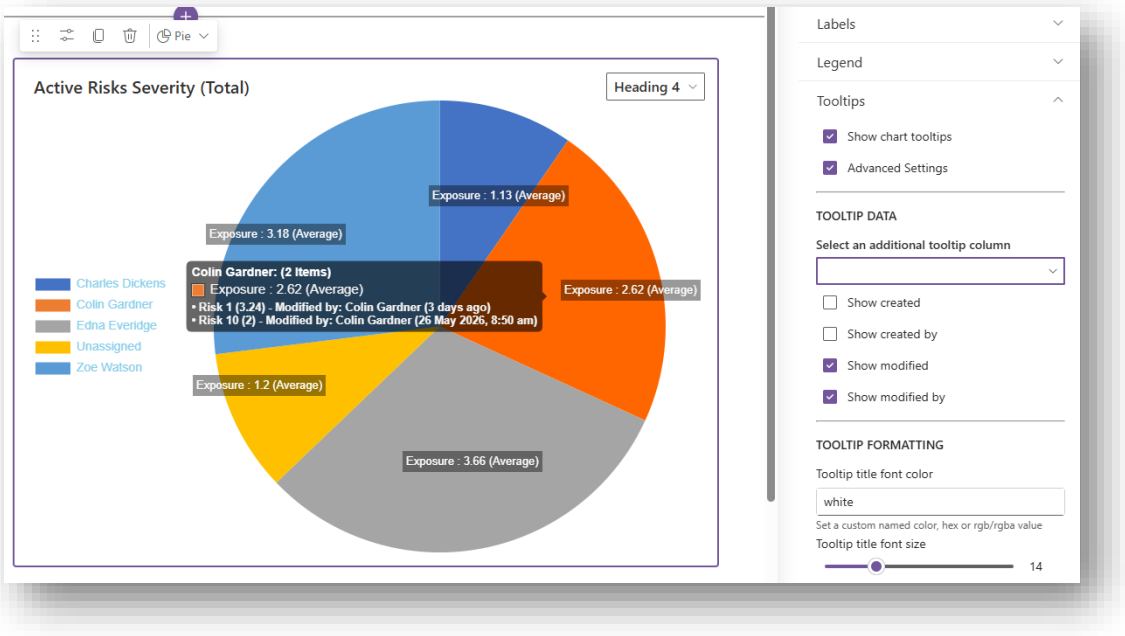
A tooltip consists of 3 areas:

- **Title**: A single line of text to be displayed as the title header for the tooltip. When a chart is grouped, the title text will be set as the group name. When the chart is not grouped, the tooltip title is set to the Title or Filename of the corresponding list item or document.
- **Body**: The tooltip body is also a single line of text but prefixed with a color cue, the same as the chart item being hovered over, so there can be no ambiguity about which tooltip belongs to which chart item. The text content of the tooltip body depends on how the web part has been configured:
    - When the chart data is not grouped or if a primary data column has not been specified, the tooltip body is not displayed at all.
    - When the chart data is grouped but no data column have been specified the body text will be the group name but will also indicate how items are in the group.
    - When the chart data is grouped and data columns have been specified, the body text will not only indicate how many items are in the group, but the data values of group as combined using the relevant aggregation function. The tooltip body will show the aggregated value for each **Numeric** column used as chart data. For most chart types

there will be just a single aggregated data value for the group but for Scatter charts and Bubble charts up to 2 or 3 **Numeric** columns may have been specified, respectively.

- **Footer**: The footer is used to provide information about the list item. When the chart is not grouped, this will be a single line of text. However, when the chart is grouped, the footer will consist of a line of text for each list item in the group.

In the screenshot below, a Pie chart has been grouped by the assigned risk manager and configured to show the average Likelihood of active risks.



Notice how the body section of the tooltip shows the aggregated value (by average in this case) of all items in the group but that the footer section lists the item title and specific data value for each item in the group, together with details of when the item was last modified and by whom.

How tooltips are displayed can be refined further by apply settings using the controls in the Tooltip Data and Tooltip Formatting control sub-groups, when the Advanced Settings checkbox is selected.

Tooltip Data

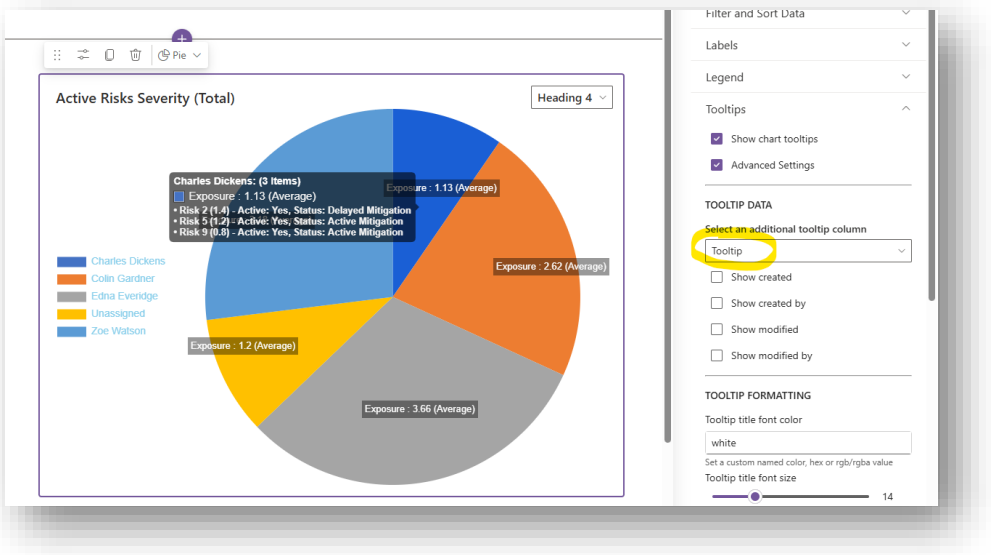
The Tooltip Data sub-group of controls are used to specify what data that is shown in the tooltip.

- **Additional Tooltip Column Picker**: This control can be used to select a column that can be used to provide additional tooltip information. Whilst only one column can be selected it is possible to use a calculated column which might construct a text value that concatenates other column values, if required.
- **Show Created Checkbox**: When checked, the date when the item was created will be shown in the tooltip.
- **Show Created by Checkbox**: When checked, the user who created the item will be included in the tooltip
- **Show Modified Checkbox**: When checked, the date when the item was last modified will be shown.
- **Show Modified by Checkbox**: When checked the user who last updated the item will be indicated.

By default, Modified and Modified by data is included in tooltips but Created and Created by information is not.

The Modified and Created date values are shown in either friendly format or a full date time values depending on how the source column is configured. By default, the Modified column is set to use the friendly, and the tooltip will display values like “2 days ago” or “yesterday”.

The screenshot below shows the tooltip where an additional column (called Tooltip) has been selected.



In this case Tooltip is a calculated column which concatenates the item Active and Status values into a single line of text. Note that you can use most field types as a tooltip. In most cases, the title of the column you chose will but used as prefix for the value, so if the Status column were selected, the value shown would be **Status: *{value}***. However, if the column happens to have a title ‘Tooltip’ the prefix is dropped and just the value is displayed.

Tooltip Formatting

This sub-group of controls can be used to customise how tooltips are rendered:

- **Tooltip Title Font Color Textbox**: Used to specify a custom font color to be used for the tooltip title text.
- **Tooltip Title Font Size Slider**: Used to specify the font size of the tooltip title in the range 8-30.
- **Tooltip Font Color Textbox**: Used to specify a custom color to be used for both the tooltip body and footer text.
- **Tooltip Font Size Slider**: Used to specify a custom font size to use for both the tooltip body and footer text. The body font size will be 2 point-sizes larger than the value specified using the control and so will be slightly larger than the footer font.
- **Tooltip Background Color Textbox**: Used to specify the background color of the tooltip.

The screenshot below shows a web part with some custom tooltip formatting properties assigned.

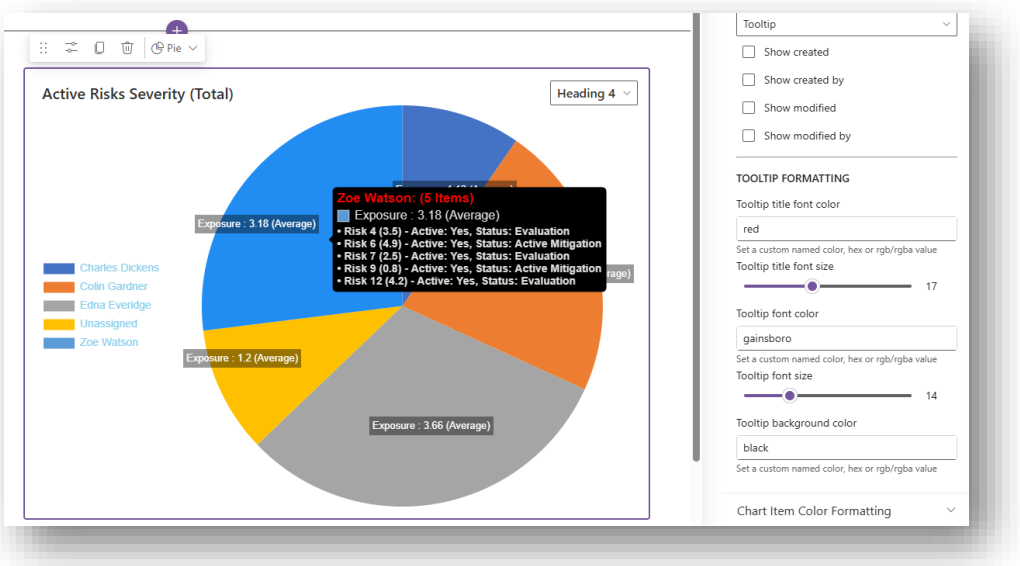
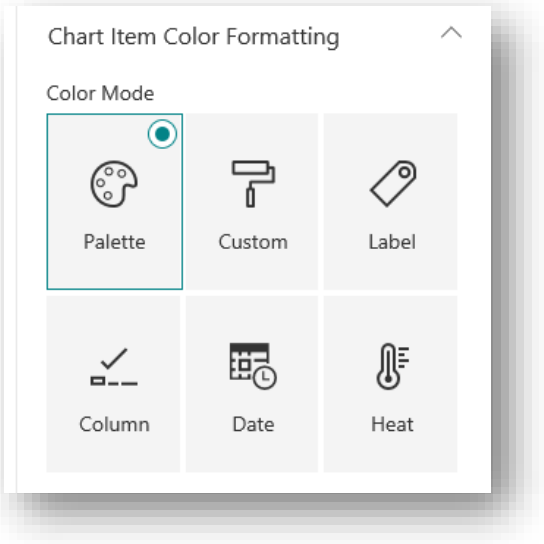


Chart Item Color Formatting

Some chart types allow for the assignment of different colors to different chart elements. Specifically, the assignment of colors on an individual chart item basis is supported in Bar, Bubble, Column, Doughnut, Pie and Polar Radar charts but not supported in the other chart types where data items are represented as plot points.

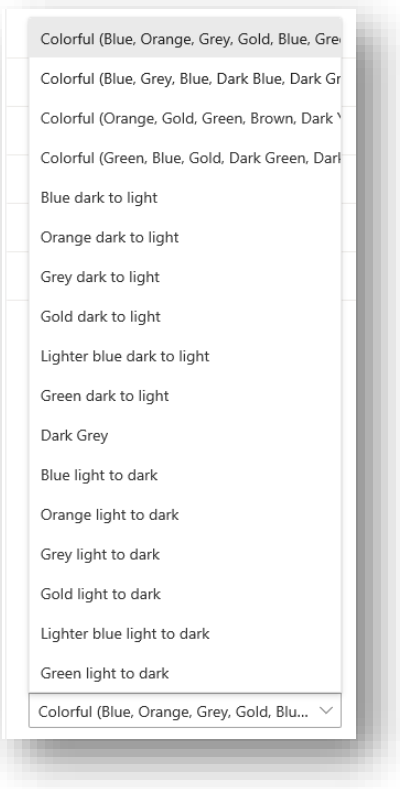
For chart types that do support custom color assignments to different chart items, K-Charts allows you to control the color in 6 main ways, or Color Modes. The **Color Mode Picker** control in the Chart Item Color Formatting group is used to set the Color Mode.



The sub-sections which follow explain the purpose and function of each color mode.

Palette Mode

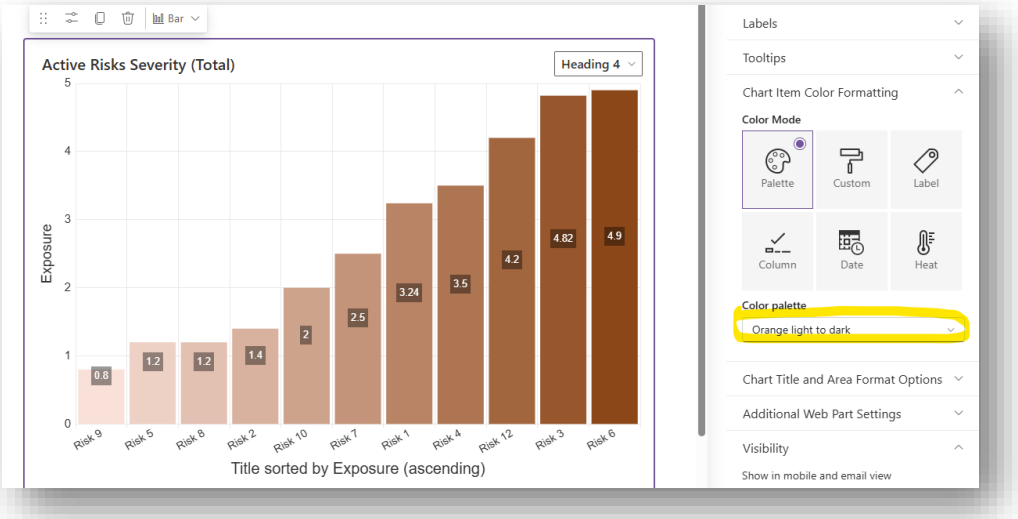
This is the default and probably the simplest color mode. When this mode is selected the **Palette Picker** control is shown and allows you to select one of 17 pre-defined color schemes, as can be seen below:



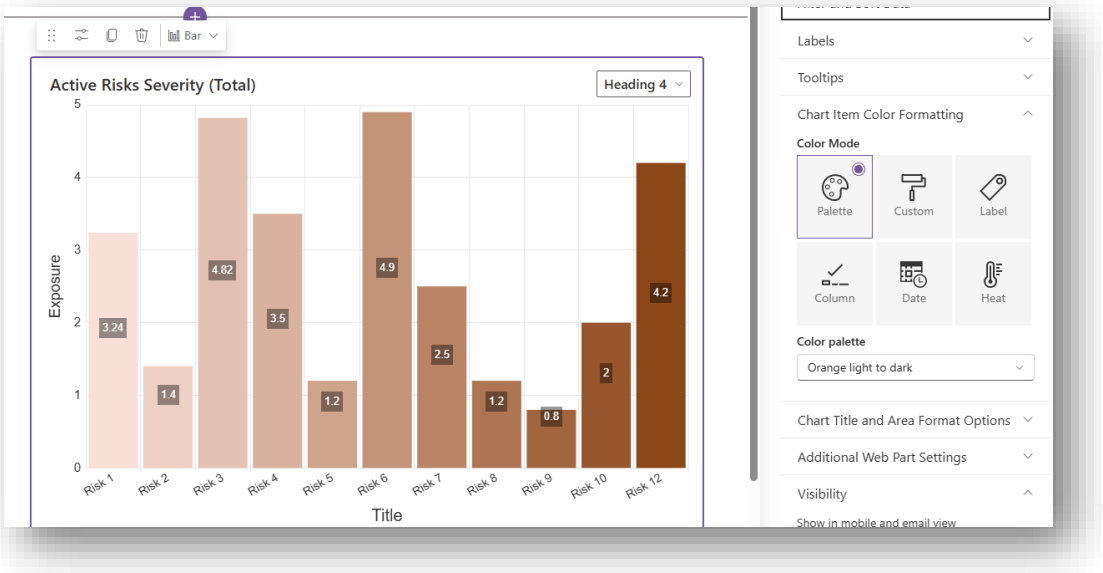
The first 4 color schemes are called Colourful as they each consist of a collection of 6 contrasting colours that will be applied to chart items sequentially, in the order listed in the picker. If there are more than 6 chart items to show the pattern starts over so the 7th item will be colored the same as the first item etc.

The other color schemes start with a base color and progress from a dark shade to a light shade or vice versa. The shade is controlled by setting the opacity of the color.

Most of the screenshots so far presented in this document have used the default Palette Color Mode with a Colourful theme. The screenshot below shows a chart based on risk exposure using an “Orange light to dark” palette.



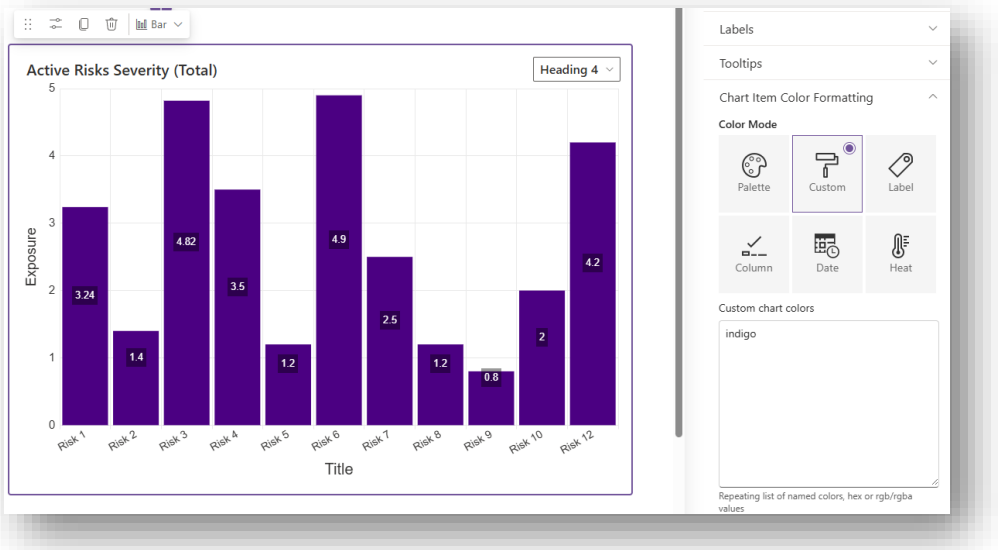
This may look like a heat map, where the color intensifies based on value, but this is not a true heat map because the items just happened to be ordered in an ascending direction based on the Y axis data values. When the items are returned in the order specified by the view, it becomes clear that the shading is not based on a data value but rather just the order in which chart items appear in the chart.



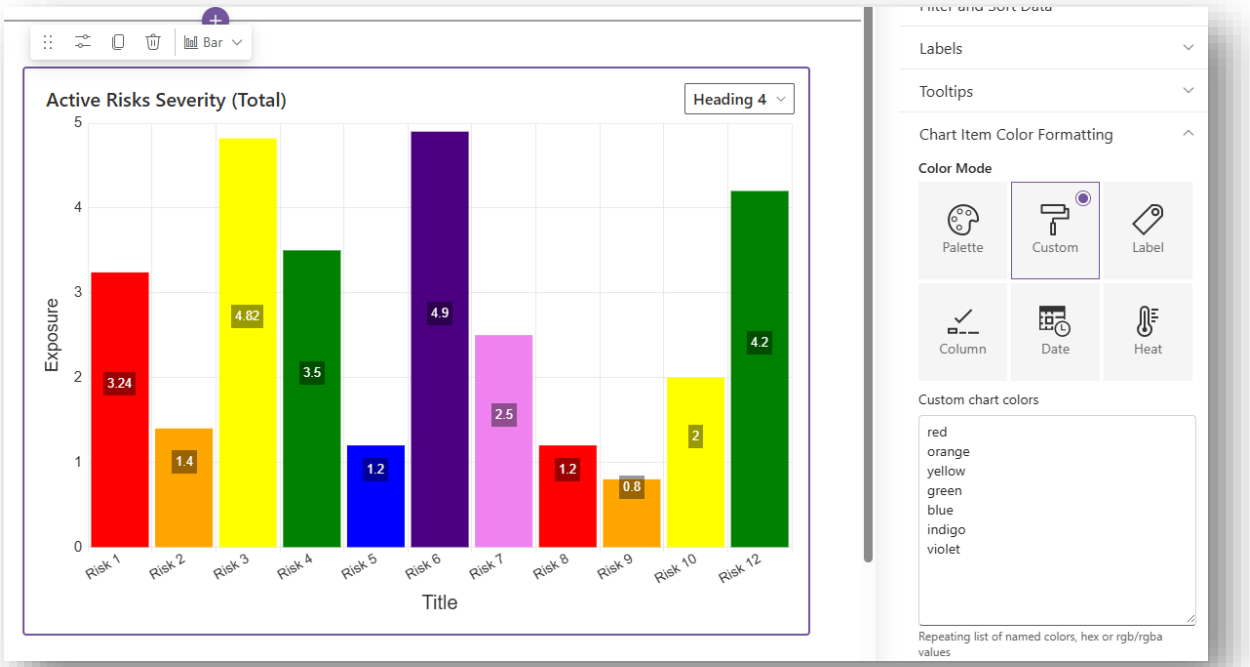
Palette Color mode may be perfectly acceptable in many scenarios, but it does not provide you with a means to set chart item colors based on business logic unless you order the data to coincide with the color assignment.

Custom Mode

When Custom Color mode is selected, the **Custom Chart Colors Textbox** is displayed. If the **Custom Chart Colors Textbox** is empty, the Palette Color mode will be used but if a valid color value is added to the textbox this will then be used to color all chart items, as can be seen below:



If you add multiple custom colors, one on each line in the **Custom Chart Colors Textbox**, then the chart items will be colored on a repeating pattern based on the number of color values you provide. Using Custom Color mode, you can create a chart that uses a veritable rainbow of custom colors!



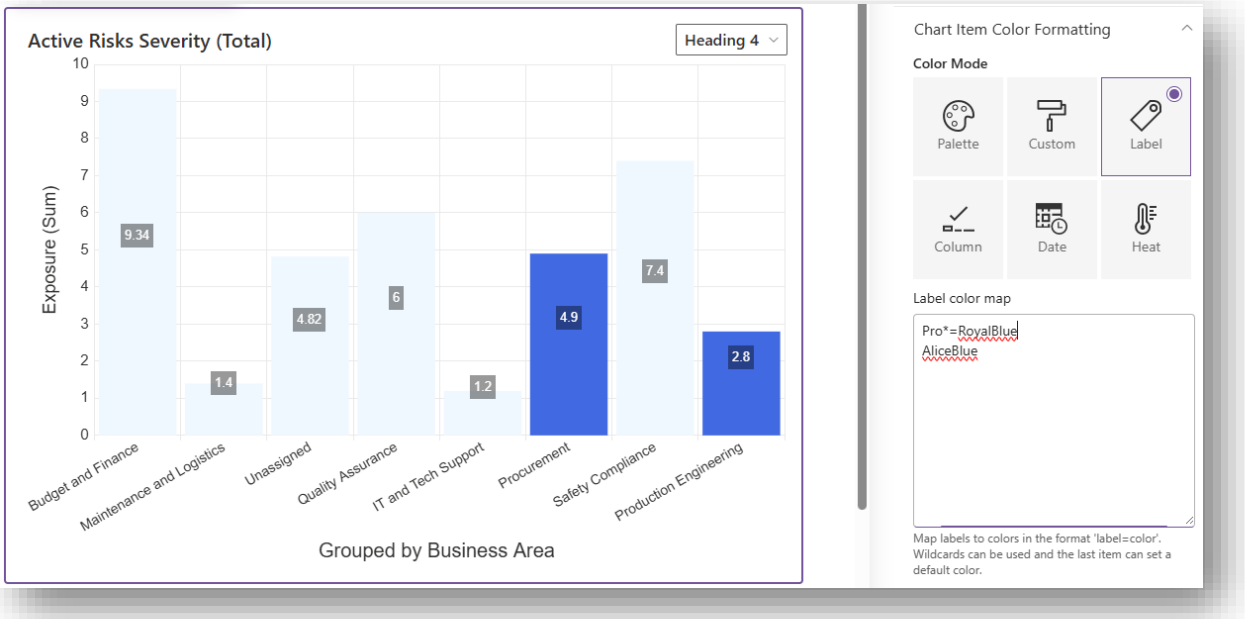
Label Mode

When Label Color mode is selected you can use the **Label Color Map Textbox** to explicitly map chart items by their label value to a specific color. Just add each mapping on a separate line in the format: {Label}={Color}

Items not explicitly assigned a color value will be shaded according to the theme used in the site.

Alternatively, you can provide a default color by adding it as the last item in the textbox.

You can also use wildcards in the color mapping. The following will map any label beginning with Pro to use the color Royal Blue and anything else that can't be matched, is colored Alice Blue.

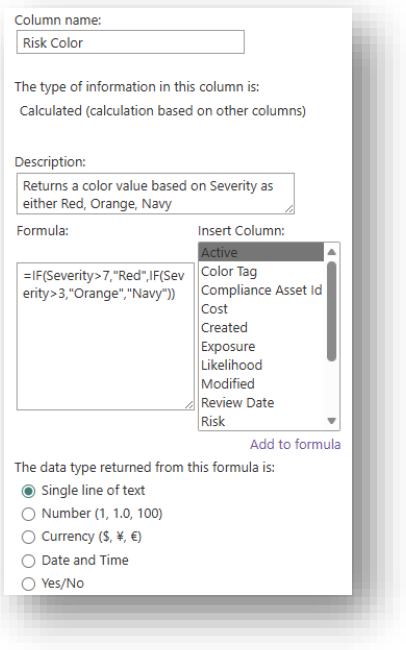


Be aware that label color mappings are applied sequentially so that mappings applied later in the list will take precedence.

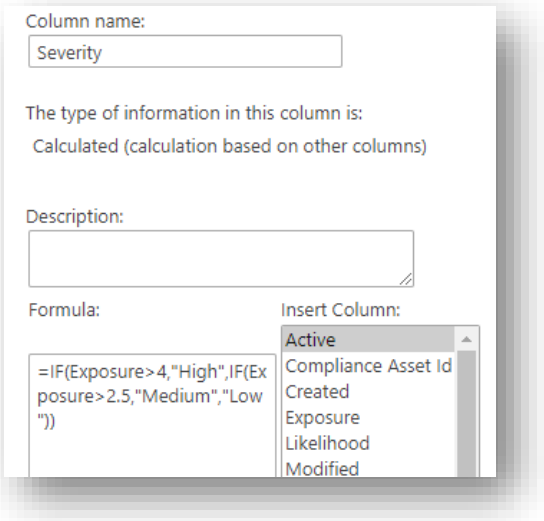
Column Mode

When Column Color Mode is set, the color of chart items will be determined by a SharePoint column value defined in the list item. This column can be of any type that returns a text value so long as that value can be evaluated as a color.

In the risk log example, a calculated column called Risk Color was set up using the formula as shown below:

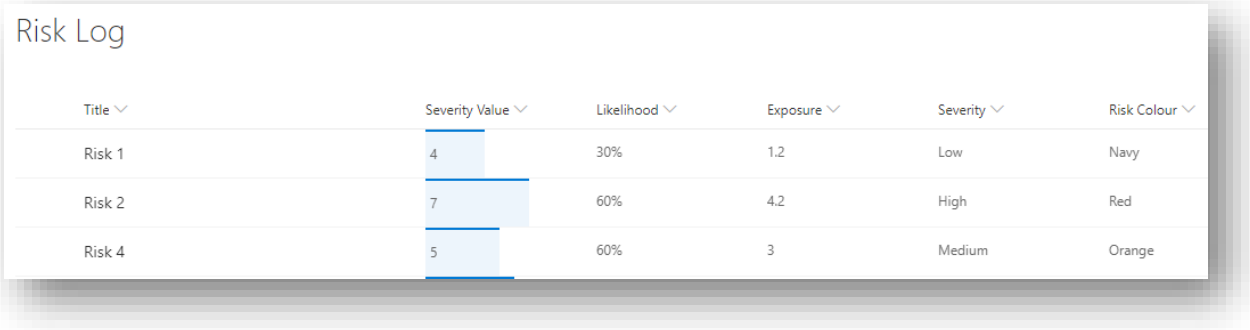


This formula simply returns an appropriate color value (Red, Orange or Navy) based on the value in the Severity column. The Severity column is itself a calculated column which returns a text value High, Medium or Low based on the value in the Exposure column.

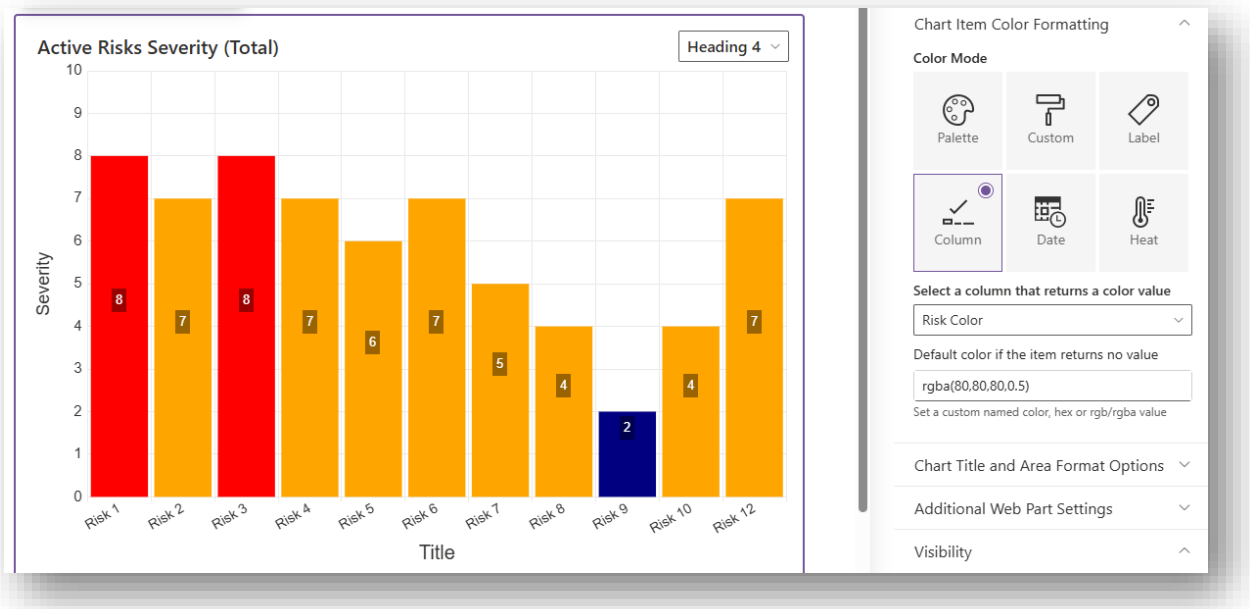


And, as explained earlier in this document, the Exposure is yet another calculated column, this time based on values set by users in the Likelihood and Severity Value columns.

The screenshot below shows the first 3 items in the list, where is can be seen that Severity values of Low, Medium and High map to Risk Colour values of Navy, Orange and Red respectively.



Now that we have the SharePoint list able to return a value that can be evaluated as a chart color, in Column Color Mode we can simply connect the web part to the correct column using the **Color Column Picker** control.



The **Default Color Textbox** can be used to define a color that should be used for chart items that are empty or do not return a value that can be evaluated as a color.

If the chart is grouped, the aggregated value for the group cannot be used to drive chart item color[9]. Instead, the color of grouped chart items is generally taken from the first item assigned to the group.

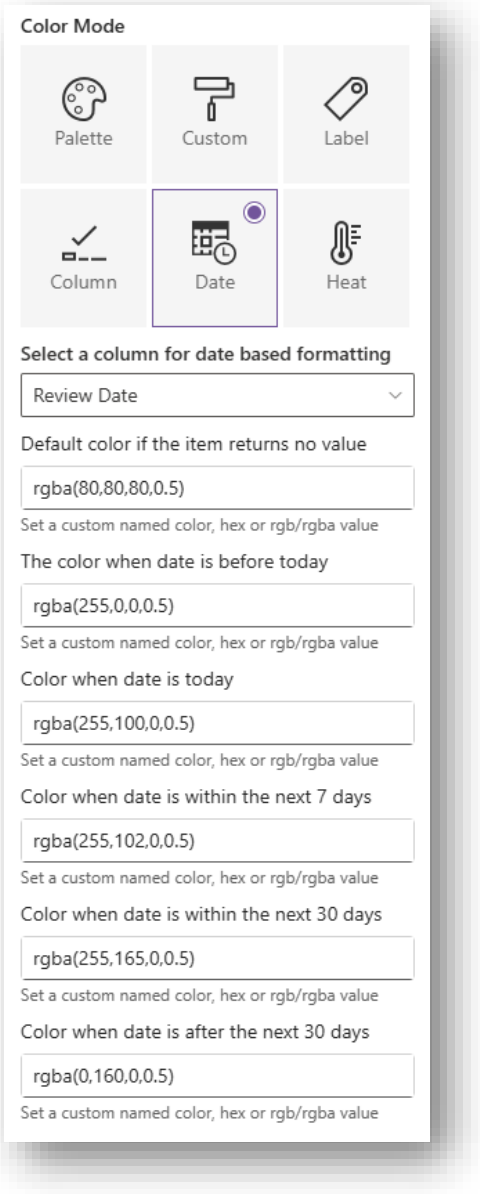
Column Mode works well when chart items are not grouped as each chart item represents a SharePoint list item or document and so may have a discrete color value. When chart items are grouped, Color Mode is less useful as the color of the chart element may not necessarily be same for all items in the group.

[9] Whilst it might technically be possible to reverse apply a SharePoint column formula to an aggregation of grouped column values, such a process could only work for calculated columns and could not work for a text column or a choice column, where the color value is explicitly set by the user.

Date Mode

When in Date Mode, the value of a date/time column can be used determine the color of chart items based on an offset from the current date and time. When in Date Mode, a **Date Color Column Picker** control is displayed, along with 6 Color Textbox controls. The **Date Color Column Picker** control is used to select the SharePoint date/time column that should be used as the basis for the calculated difference between that date value and the current date/time i.e. the data and time when the web part was rendered on the page.

These controls, along with their default color values, are shown below:

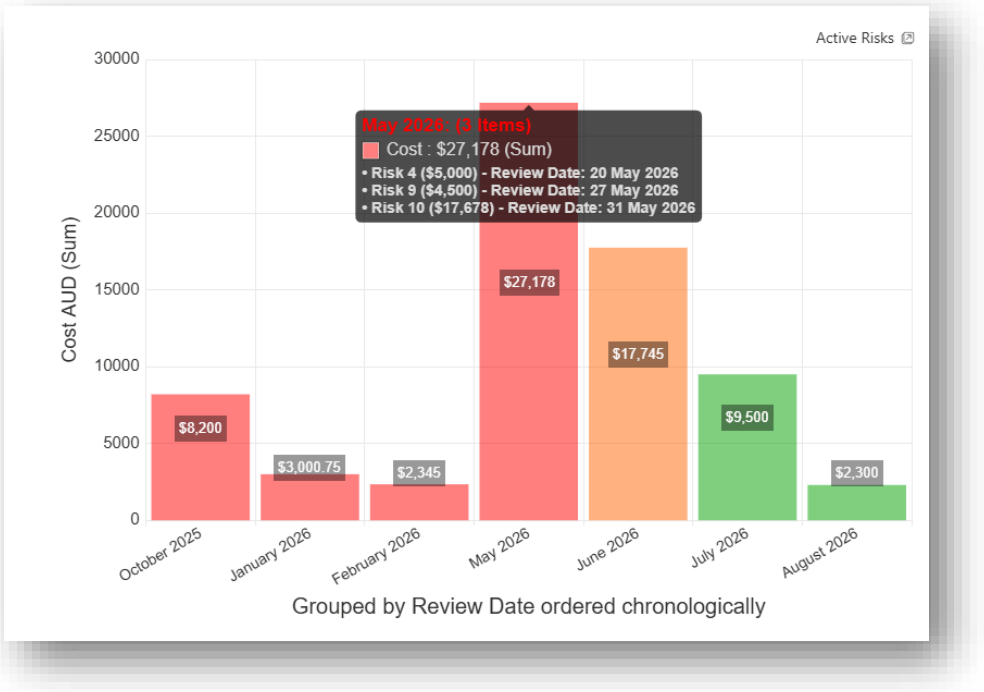


The color textbox controls allow you to set different colors according to the date/time difference calculation. You can set different colours for the following:

- When the SharePoint item has no date value
- When the date value is in the past
- When the date value is the current day

- When the date value is within the next 7 days
- When the date value is within the next 30 days
- When the date value is more than 30 days in the future.

The screenshot below shows the risk items grouped by their next review date (using the month and year values – so that items are effectively grouped by month) and ordered chronologically.

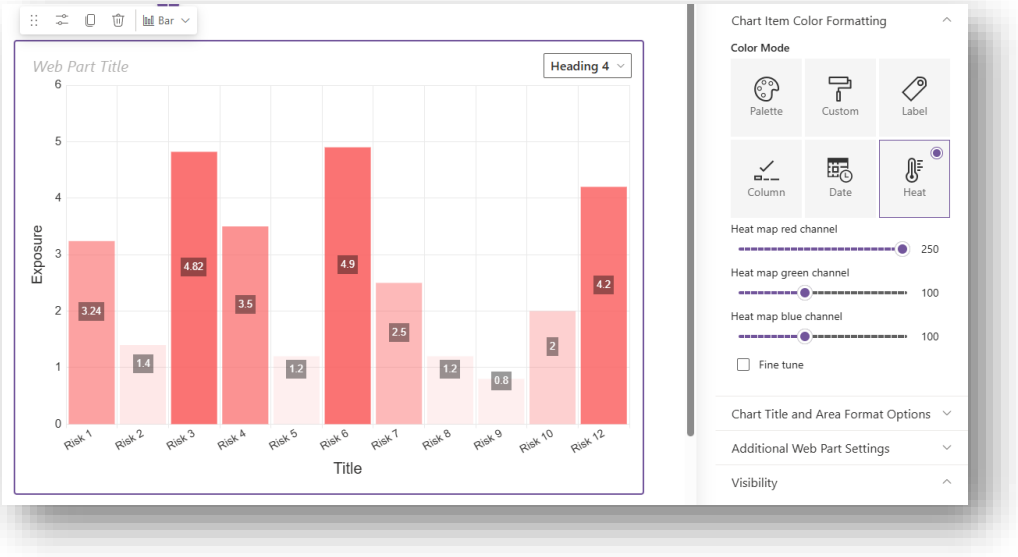


Date Mode behaves slight differently to Column Mode in that when the chart is grouped, the chart item takes the color of the earliest item in the group.

Heat Map

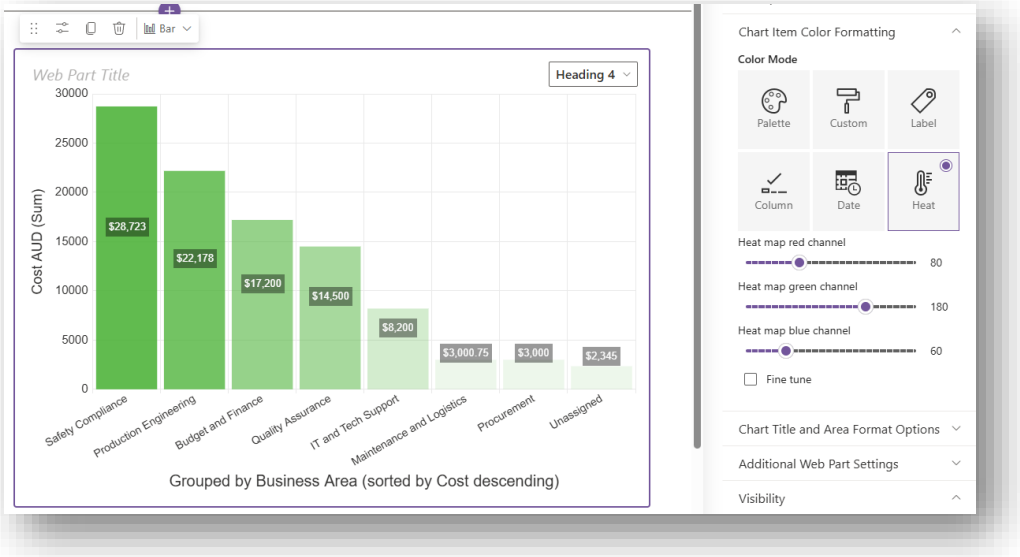
Heat Map mode generally works by examining the range of values in a data set and setting the opacity of chart item based on where the data value for that item lies within the range of data values. Chart items with data values closer to the upper end of the range are rendered more opaquely than chart items with data values that reside at the lower end of the data range, which appear more translucent. Or, to put more simply, items become progressively more transparent when they have a lower value.

Heat Map mode can only work if the chart has been configured to use a numeric data column.



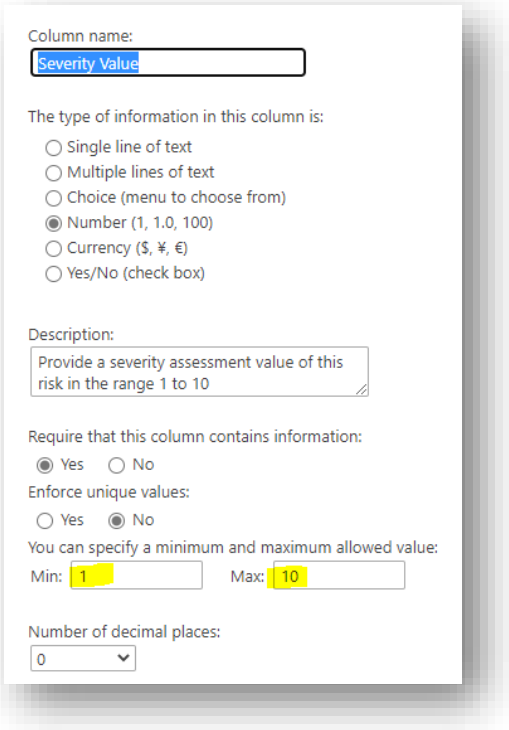
As Heat Map mode works on setting the alpha channel (transparency) value, it is not possible to use named colors but instead you specify the heat map color using the 3 slider controls which allow you to set values in the red, green, and blue color channels as can be seen in the screenshot below

You can use the color channel slider controls to set any appropriate base color. When data is grouped the color-coding is based on the aggregated group value.



If the **Numeric** column used for the heat map is constrained between a set of possible values then the maximum and minimum value set in the SharePoint column will be used as the logical extremities of the data set for the purposes of setting opacity, rather than the bounds which would otherwise be set by the values in the items being rendered in the chart.

For example, in the Risk Log scenario, both the Likelihood and the Severity Value column are constrained within limits defined by settings applied to the SharePoint column.



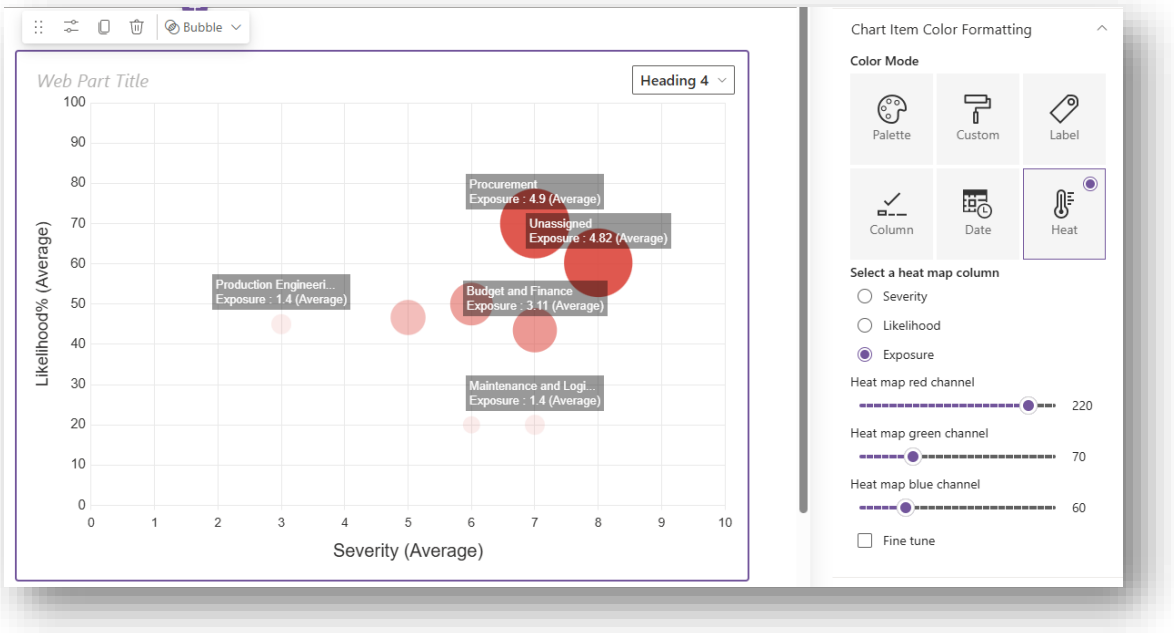
The screenshot above shows how the Severity Value column can only accept value in the range 1-10. Similarly, the Likelihood Column can only accept values in the range 0-100 (and is expressed as a %).

Therefore, for these columns, the extreme values used for the color map will be 1 and 10 and 0 and 100 for the Severity Value and Likelihood columns, respectively.

For columns where only one limit has been set i.e. either the minimum value or a maximum value has been set, but not both, this will be used as either upper or lower boundary value for the color map. When no limits have been set in the SharePoint column, the maximum and minimum values of the items in the chart will be used to set the bounds for the heat map.

Where possible, it is recommended to set Numeric columns with bounds. Not only will this result in better performance as there is less processing involved but it will also result in a more accurate heat map which avoids unexpected shading when data is tightly clustered and has no outlying values to set the realistic set of bounds from which the heat map can be rendered.

When you select a Bubble chart, the numeric column used to determine the heat map color will need to be selected. Note that a heat map column is not set automatically and so initially the bubble will be rendered in a default color based on the selected theme for the site.

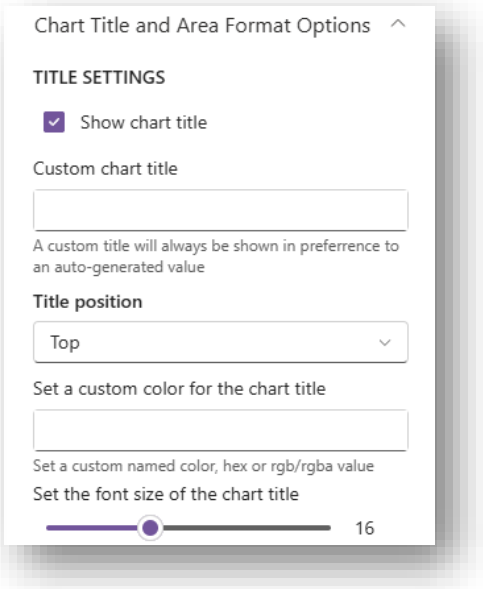


Selecting the same data column for the heat map as is used for the r-axis (the bubble radius) will amply high value items in 2 dimensions, namely the size of the bubble and its color intensity (opacity).

Chart Title and Area Format Options

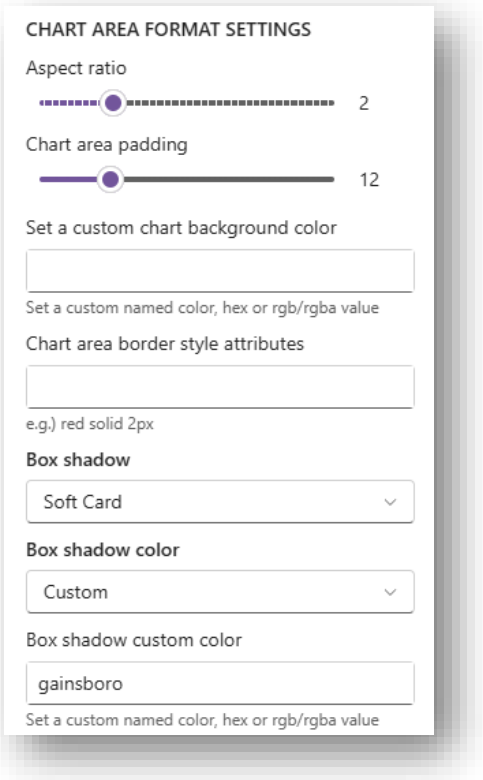
The controls in this group allow you to configure how, and if, a chart title is displayed and apply custom formatting to the chart area.

Title Settings

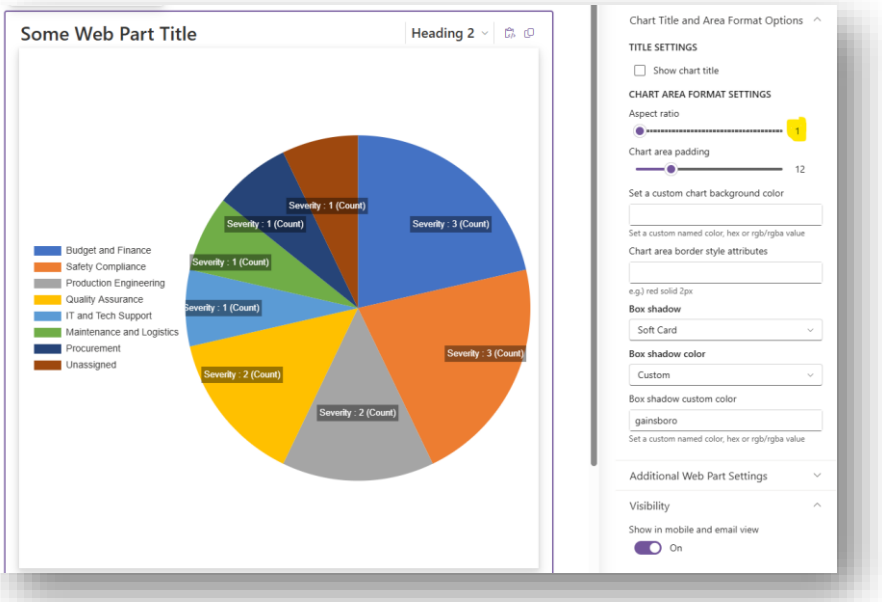


- **Show Chart Title Checkbox**: When checked, a chart title will be displayed, otherwise a title for the chart will not be rendered. You may choose to use to set a value in the web part title in lieu of the chart title or you can use both (or indeed neither). The remaining controls in this group are only displayed when this checkbox is checked.
- **Custom Chart Title Textbox**: K-Charts will construct a default value for the chart title which is simply the concatenation of the selected list and view (appended in square brackets). However, you can override this default and set a custom chart title, simply by typing a value in this textbox.
- **Title Position Picker**: This control is used to select where in the chart area, the title will be rendered. The title position can be set to one of the following values:
    - **Top**: The title will be horizontally displayed and centrally aligned at the top of the chart area.
    - **Bottom**: The title will be horizontally displayed and centrally aligned at the bottom of the chart area.
    - **Left**: The title will be vertically displayed and centrally positioned on the left of the chart area.
    - **Right**: The title will be vertically displayed and centrally positioned on the right of the chart area.
- **Title Font Color Textbox**: Used to set a custom font color for the chart title.
- **Title Font Size Slider**: Used to set the font size of the chart title in the range 8 to 30 with the default value being 16.

Chart area Format Settings

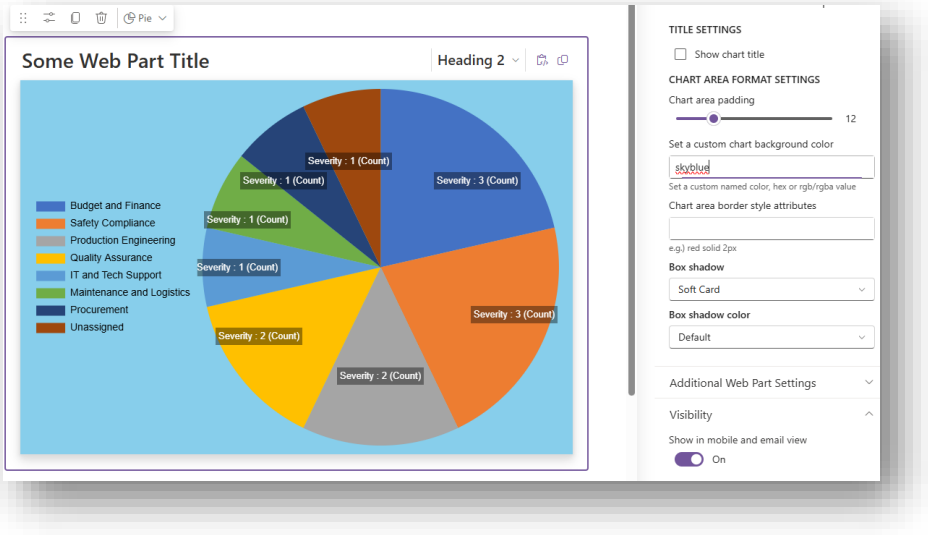


— **Aspect Ratio Slider**: This control is used to set the aspect ratio of the chart area. The default value is 2, meaning that the height of the chart is twice that of the width. A value in the range 1 to 5 can be set in increments of 0.1. The screenshot below shows a chart with the aspect ratio set to 1 i.e. the chart area is square.

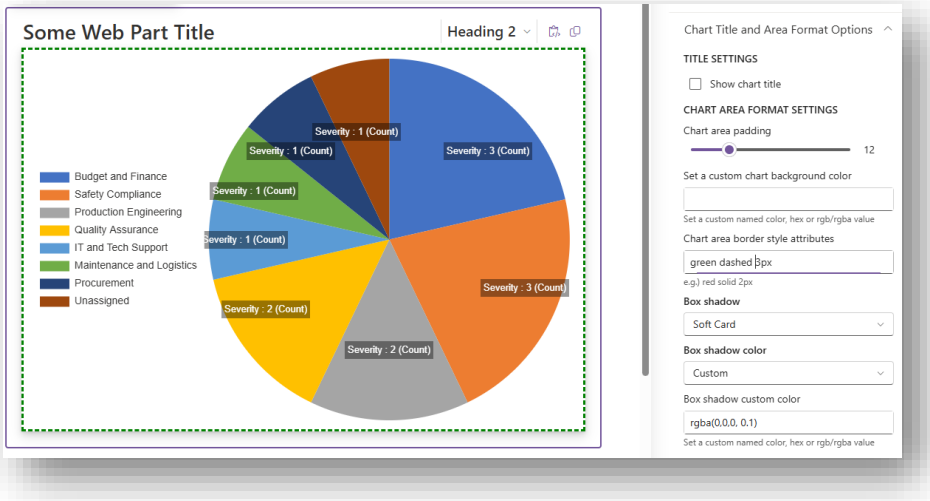


— **Chart Area Padding Slider**: Controls the padding (in pixels) around the chart area. The value can be set in the range 0 to 50.

— **Chart Background Color Textbox**: Use this control to set a custom color for the chart area.



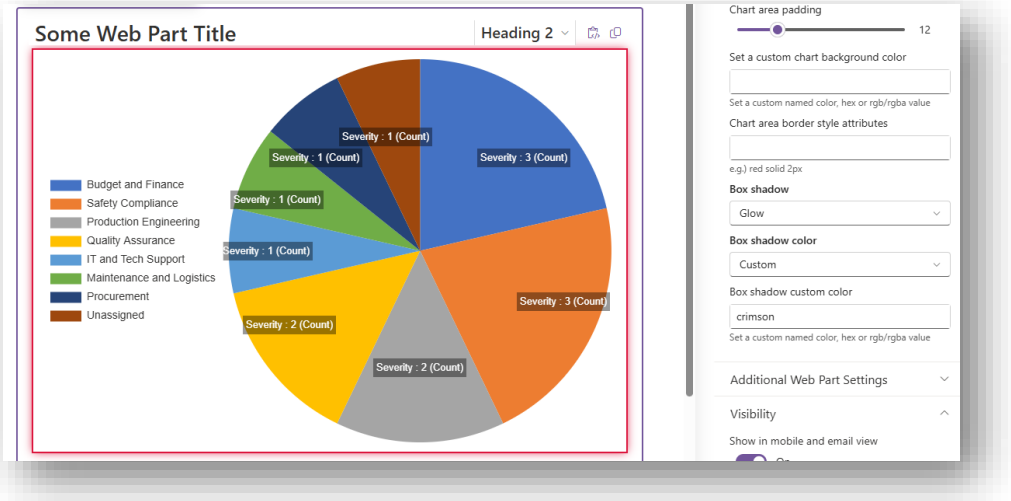
— **Chart Area Border Style Attributes Textbox**: You can use this control to specify if and how a border will be displayed around the chart area. The screen shot below shows how a green, dashed border is displayed:



— **Box Shadow Picker**: This control is used to specify if and how a drop shadow effect is added to the chart area.

— **Box Shadow Color Picker**: This control is used to specify the color to be used for the box shadow effect. The default colour is the named HTML color, Gainsboro but you can choose a theme color or use a custom color.

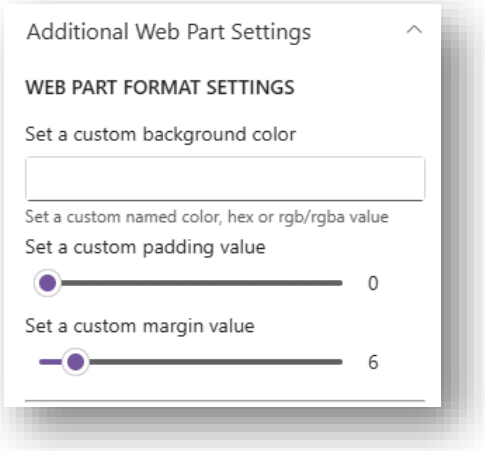
— **Box Shadow Custom Color Textbox**: This control is only displayed when the box shadow color mode is set to custom. You can provide any valid hex, rgb/rgba or HTML named color. The screenshot below shows the Glow box shadow option with a custom color.



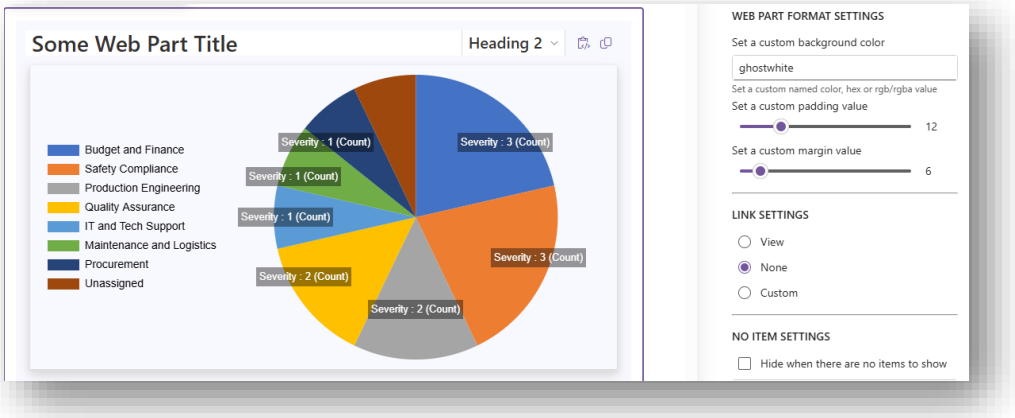
Additional Web Part Settings

This controls in this group provide access to additional web part settings

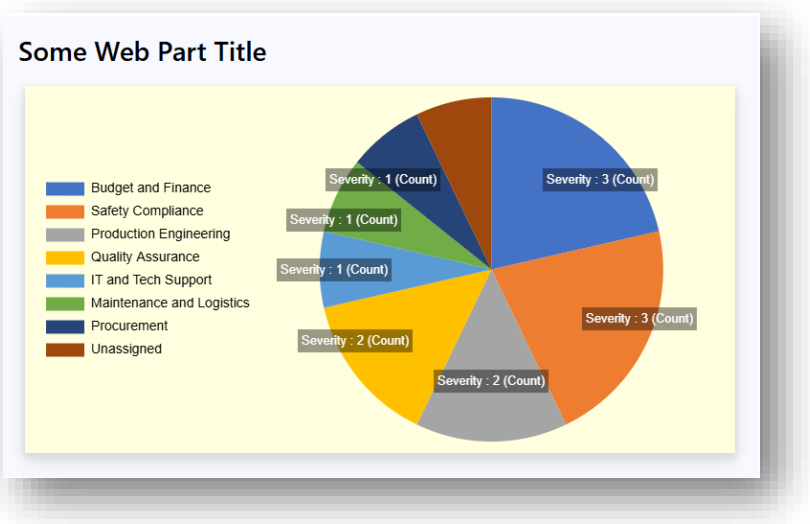
Web Part Format Settings



— **Background Color Textbox**: This textbox can be used to apply a custom background color for the whole web part.

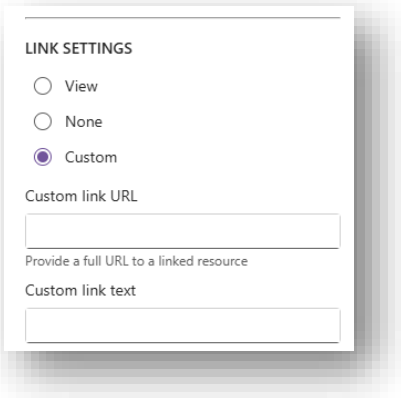


If you set a custom background color for the chart area this will still be applied.



- **Web Part Padding Slider**: Used to set the padding (in pixels) between the web part and its inner controls. By default, this is zero but can be set in the range 0 to 50. If you choose to set a custom web part background color, you will likely want to set a padding value to 12 or more as without any padding the web part looks ugly!
- **Margin Slider**: Used to set the margin (in pixels) between the web part and the chart area. By default, this is zero but can be set in the range 0 to 50.

Link Settings

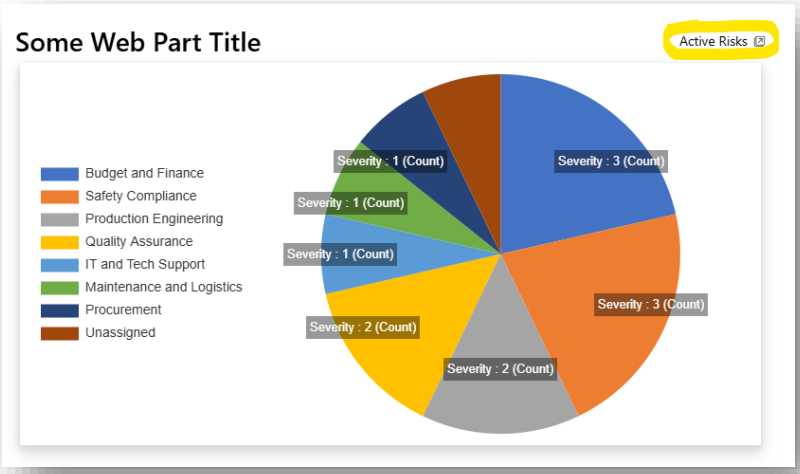


These controls are used to set if and how a link is displayed in the web part header. The options are:

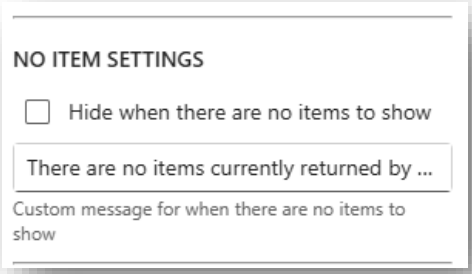
- **View**: A link to the view used by the web part will be displayed.
- **None**: No link is displayed.
- **Custom**: You can set any custom URL and link text.

The **Custom link URL** and **Custom link text** textboxes are only displayed when the **Custom** option is selected.

When a link is specified, it is displayed in the web part header. Clicking the link will open URL in the current browser window but clicking the open icon next to link will open the link a new browser tab.

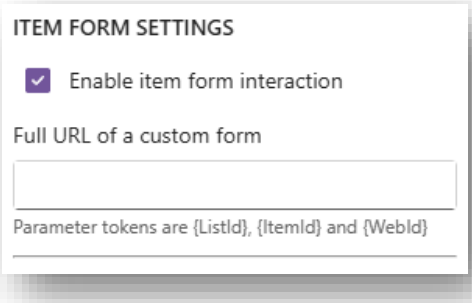


No Item Settings

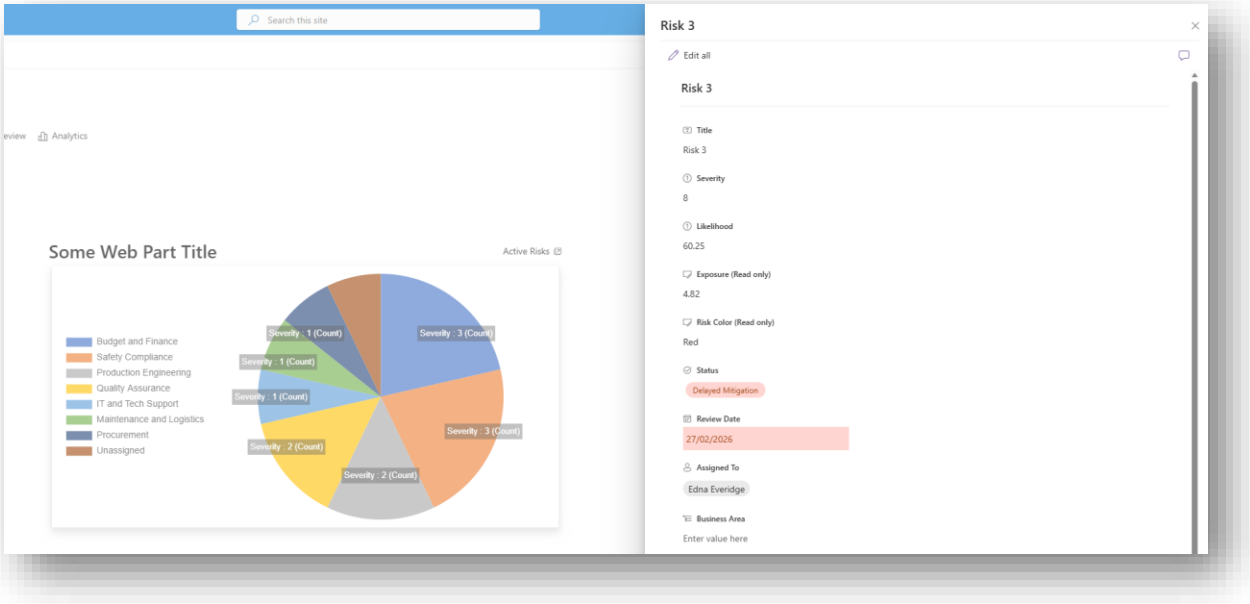


- **Hide when now items checkbox**: When checked the web part is hidden if the view returns no items to display.
- **No items message textbox**: Use this textbox control to set a custom message to be displayed when the view returns no items. This message is only shown when the hide checkbox is unchecked.

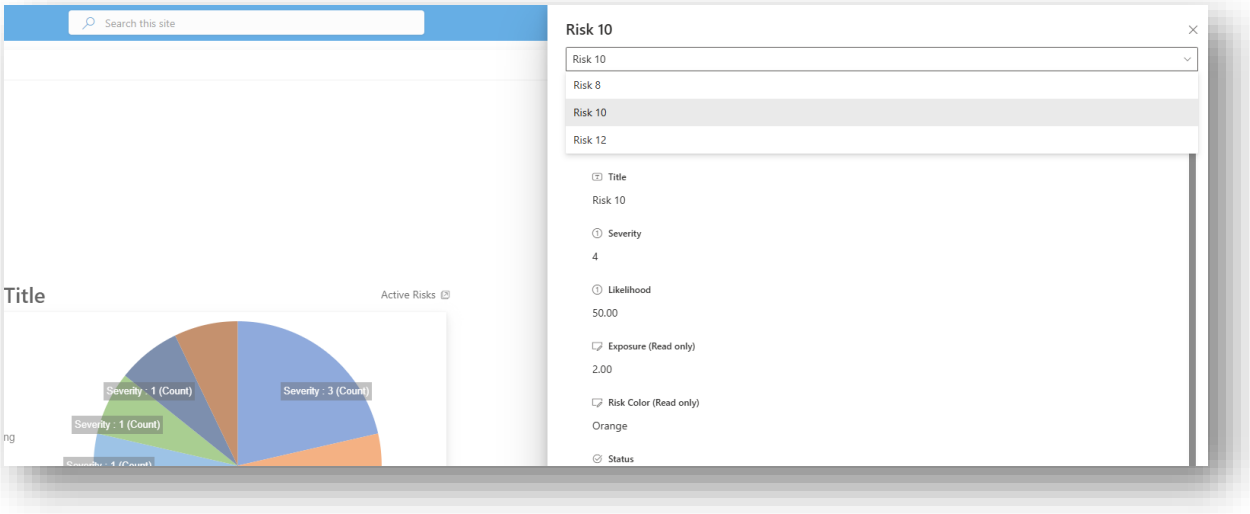
Item Form Settings



- **Enable item form interaction checkbox**: When checked, the standard SharePoint form is displayed in a side panel whenever a chart element is clicked. This enables users to interact with list items directly from the chart.



In the case of grouped charts, the UI provides a picker so users can select an item.

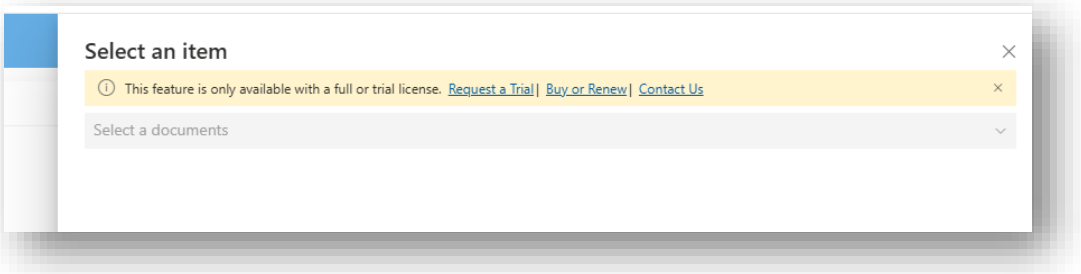


If the chart is connected to a document library, users can preview the document from the panel as well as interacting with item properties.

From the review panel, users can open the document in a separate browser tab or in the relevant client application (in the case of MS Office format documents).

When the panel is closed, the web part data is reloaded so that any changes which affect chart rendering can be seen immediately.

Please note that list item/document integration is a premium feature only available for customers with a full or trial license. If you try and access the panel with a Freemium license, a warning message is displayed.

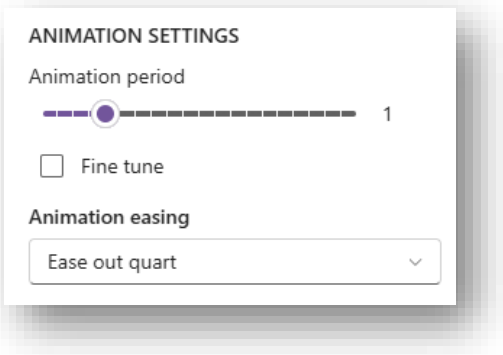


- **Custom Form URL Textbox**: If you use a custom form solution with the list such as Nintex or Plumsail Forms you can use this text box to set a custom URL to the form. You can optionally include the following tokens in the URL:
  - **WebId**: The unique ID of the source web
  - **ListId**: The unique ID of the source list or library
  - **ItemId**: The number ID value for the list item or document

When constructing a custom URL, you can use these tokens which will get replaced with actual values at run time. Be sure to include the brace { } characters as part of the parameter. For example, if your custom form technology requires the item Id to be passed in as a web parameter then your URL will look something like:

https://[***path to form***]?itemId={ItemId}

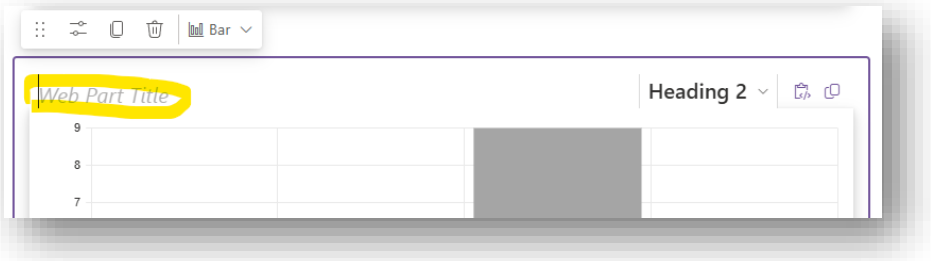
Animation Settings



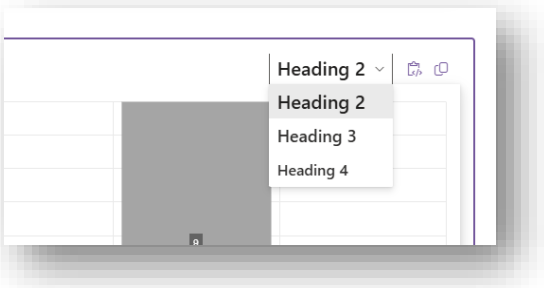
- **Animation Period Slider**: Used to set the length of time for chart animations. By default, this is set to 1 second but a value in the range 0 to 5 can be set. Setting a value of zero disables animations.
- **Animation Easing Picker**: Choose the animation rending algorithm. There are 21 to choose from!

Web Part Header

In addition to, or in place off the chart title, you can set a custom text value as the title of the web part. The web part title is not set from a control on the property pane but rather a value can simply be typed in web part title area, directly when in page edit mode.

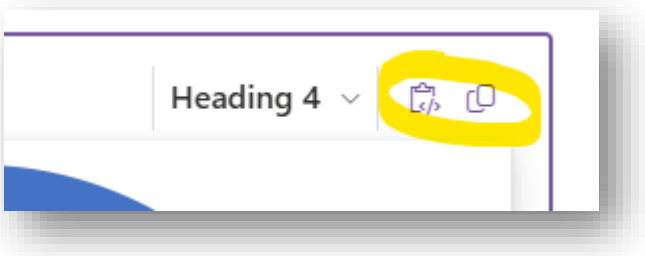


You can use the style picker to select the style of the of the web part header text.



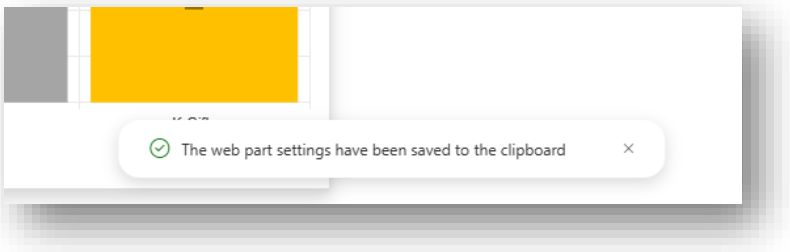
The style picker is only displayed in page edit mode

You can also export the web part configuration by copying it to the clipboard or paste the copied setting from another web part instance, using the copy/paste buttons available when in page edit mode.

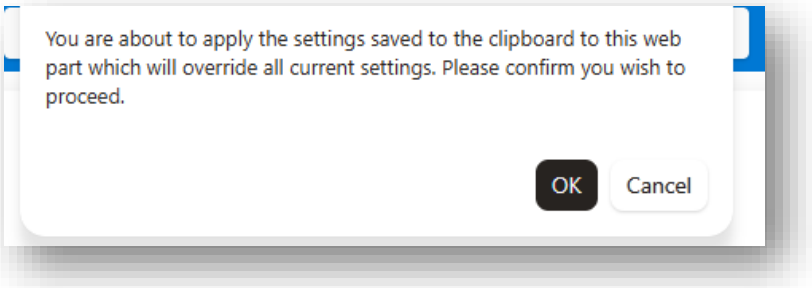


We appreciate that setting up each web part can be time consuming as there are so many configuration options and settings and recognise that you might often want a common look and feel to your charts. This provides an easy way to copy a chart not just between web parts in the same pages but also on different pages (in different sites even).

When you copy web part settings, a notification message is briefly displayed in the UI, at the bottom of the screen.



When you paste settings into an existing web part instance, you will need to confirm the action.

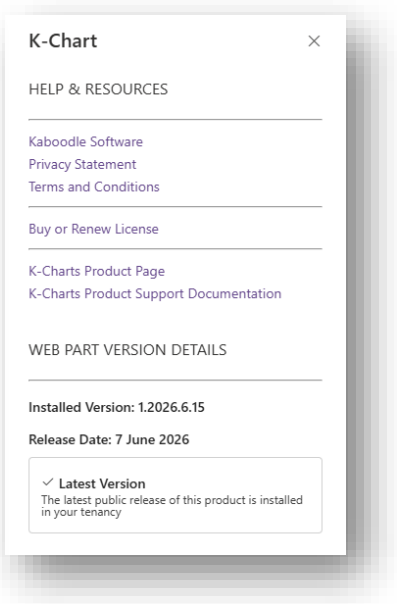


If you choose to proceed the target web part will be updated immediately and chart re-rendered with the new settings.

The UI will report an error if you try and paste invalid clipboard content.

Web Part Information

The 2nd page of the web part configuration pane provides links to resources and additional information about the version of the web part installed on your tenancy.



Help & Resources

The help and resources group contains links to the following resources:

- **Kaboodle Software**: A link to the homepage of the Kaboodle Software Internet site**.**
- **Privacy Statement**: A link to the privacy on the Kaboodle web site.
- **Buy or Renew License**: A link to the license purchase and renewal page where you can buy a new license or renew an existing one.
- **Terms and Conditions**: A link to our terms and conditions page
- **Buy or Renew License**: A link to the Kaboodle Software license page where you can generate a quote and purchase a product license, should you wish to upgrade from the Freemium version of K-Charts.
- **K-Charts Product Page**: A direct link to the K-Charts product support page on the Kaboodle Software Internet site
- **K-Charts Product Support Documentation**: A direct link to the latest version of this document in PDF format, hosted on our CDN.

Web Part Version Details

This group provides information about the version of K-Charts currently installed on your tenancy and about the latest version available for download:

- **Installed Version**: The version number of the version of K-Charts currently installed in your tenancy.
- **Release Date**: The date when the currently installed version of K-Charts was released.
- **Product Status Button**: A short message reporting whether you are using the latest product version or if a newer version is available.
- **Latest Version**: The version number of the most recent publicly available version of K-Charts
- **Release Date**: The date on which the latest version of K-Charts was released.

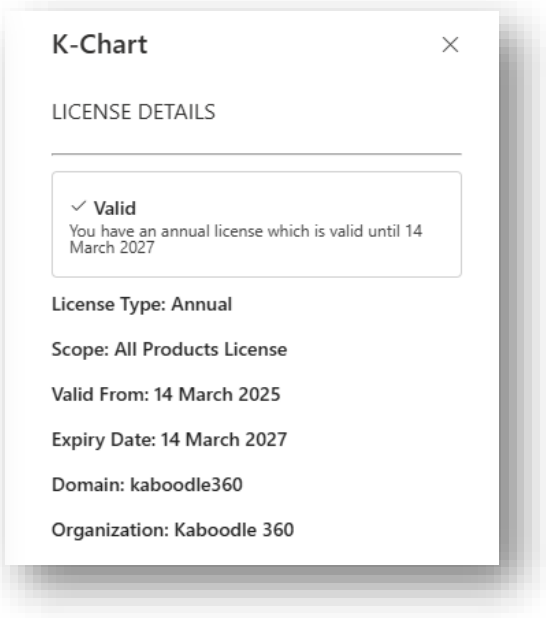
Note that the **Latest Version** and the associated **Release Date** is only shown if there is a newer product version available for download.

Licensing

This section provides key information about product licensing

Licensing Details

The 3rd page in the web part configuration pane provides information about your product license.



If you do not have a paid license, the UI will report that you are using a Freemium license.

Request for Quotation

A quotation can be self-generated from you web site at https://kaboodle.software/Buy and is based on the number of licensed users in your tenancy.

If you require a formal quotation or would prefer to pay by international bank transfer, then please contact us using the contact form at https://kaboodle.software/Contact or email us directly at info@kaboodle.online and we will be happy to help.

Prices start from $250 USD and are payable annually. A paid-for license entitles you to technical support and free product upgrades.

If your paid license expires, the solution will simply revert to operating in freemium mode.