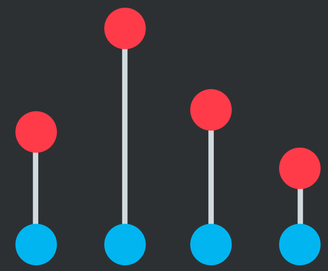
vaadin}>

Vaadin Charts



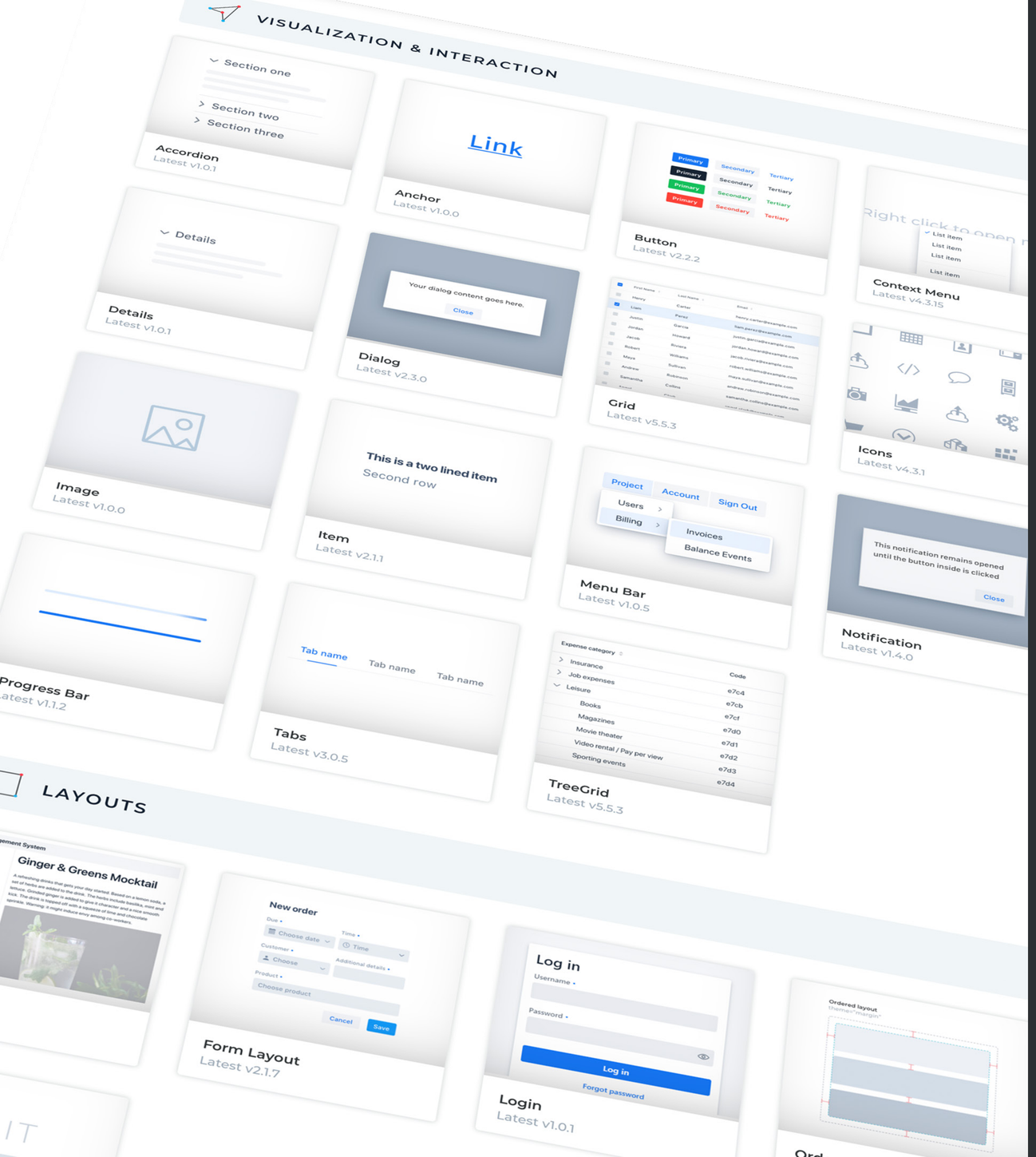
A UX-FIRST, WEB COMPONENT-BASED
CHARTING SOLUTION FOR DATA VISUALIZATION
IN VAADIN WEB APPLICATIONS

Overview

Vaadin Charts is a premium UI component built on the platform-agnostic Web Components standard. It encapsulates a feature-rich, interactive graph library that allows web applications to generate charts and graphs based on data.

The powerful API allows you to configure over a dozen chart types. A single component instance can present any of the charts and you can even combine and overlay multiple chart types. The charts look gorgeous out of the box, but you can easily define custom visual styles using CSS, if needed.

Vaadin Charts is your answer for the data visualization needs of all web applications, regardless of the technology stack used, because it ships with both Java and HTML APIs.



What are Vaadin components?

UIs in Vaadin are built using smaller interconnected parts called components—these components are based on the currently ubiquitous Web Component standards, meaning that they are platform agnostic, and widely supported by modern browsers.

To learn more about Vaadin components, get our dedicated Components fact sheet.

What are web components?

The Web Components specification uses a suite of 3 technologies that together allow you to build custom, reusable HTML components. The technologies are: Custom Elements, Shadow DOM and HTML Templates. As these technologies are widely supported, web components can now be used on all major web browsers, effectively making them platform agnostic.

Note: Web Components require the use of polyfills to function correctly on Microsoft's now deprecated IE11 and non-chromium Edge browsers.

Available chart types

Line & Spline chart

Line and spline charts connect a series of data points with lines. Line charts use straight lines between the data points, whereas spline charts feature connecting lines that are smooth polynomial interpolations.

OHLC charts

An open-high-low-close (OHLC) chart displays changes in price over a period of time.

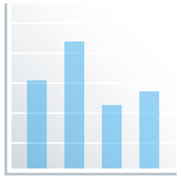
Candlestick charts

Candlestick charts offer an alternative way to visualize OHLC data. The candlestick has a body and two vertical lines, called wicks. The body represents the opening and closing prices. If the body is filled, the top edge of the body shows the opening price and the bottom edge the closing price.

Area charts

Area charts are like line charts, except they fill the area between the line and a threshold value on the Y axis. The threshold value depends on the chart type. In addition to the basic area chart type, spline interpolation and range area charts are also supported.

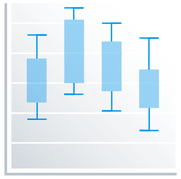
Vaadin Charts offers 4 area chart types: AREA, AREA SPLINE, AREA RANGE and AREA SPLINE RANGE



Column & Bar charts

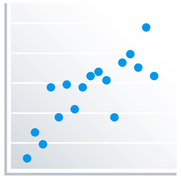
Column and bar charts illustrate values as vertical columns or horizontal bars. The two chart types are functionally similar, except that the orientation of the axes is inverted. The choice of which to use is purely an aesthetic one.

Vaadin Charts offer 3 column / bar chart types: COLUMN, COLUMN RANGE and BAR



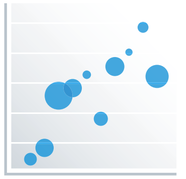
Box Plot charts

Box plot charts display the distribution of statistical variables. Each data point has a median (represented by a horizontal line), upper and lower quartiles (represented by a box) and a low and high value (represented by t-shaped “whiskers”). The exact semantics of the box symbols are up to you.



Scatter charts

Scatter charts display a set of unconnected data points. X and Y variables are plotted for each data point to visually represent how they relate to one another.



Bubble charts

A bubble chart is a special type of scatter chart that is capable of representing the data points as three-dimensional bubbles of varying sizes. Bubble charts make it easier to define the size of a point by using its third (Z) dimensional property, instead of the radius property.

Pie charts

Pie charts represent data as the slice of a pie. Each data sector is represented as a portion of the whole (sum of all the values). Donut charts (pie charts with a hole in the center) can also be created using a pie chart with an innerSize property, and you can also combine multiple pie charts to create the inner and outer rims.

Gauge charts

Gauge charts look similar to speedometers: they are one-dimensional charts with a circular Y axis and a dial that points to values on the axis. A gauge can have multiple Y axes to display multiple scales.

Vaadin Charts offers 2 gauge chart types: REGULAR AND SOLID

Range charts

Range charts plot a range of values instead of singular data points. For each point on the X axis an area or column (between a minimum and maximum value) displays.

Vaadin Charts offers 3 range chart types: AREA , AREA SPLINE AND COLUMN

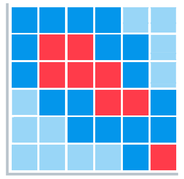
Explore an interactive demo of all the available charts here.

Funnel & Pyramid charts

Funnel and pyramid charts are typically used to visually represent stages in the sales process, or any other subsets that diminish or expand in size. The subsets are represented as horizontal layers that stack together in the shape of a pyramid or funnel. With pyramids, they decrease in size from bottom to top, and with funnels the reverse is true and the bottom layers are equal in size to form the funnel neck.

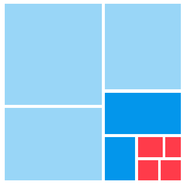
Waterfall charts

Waterfall charts are used to visually represent the cumulative effects of the introduction of positive and negative level changes. They display the initial and final level values with a series of intermittent changes in between. The changes are given as delta values, and you can have a number of intermediate totals, which are calculated automatically.



Heat maps

A heat map is a two-dimensional grid that shows the magnitude or intensity of the subject matter. The color of the grid cells vary to indicate changing values.



Tree maps

A tree map is used to display hierarchical data. It consists of a group of rectangles that contain nested rectangles. The size of each rectangle indicates the value of the item it represents.

Polygon charts

A polygon chart can be used to draw any freeform filled or stroked shape in the Cartesian plane. Polygons consist of connected data points.

Additional features:

Flags

Flags allow you to annotate the X axis of a chart or a series of data points with callout boxes. These annotated flags can be used to indicate interesting points or events about the series or axis. Flags are defined as separate items and do not form part of the data series

Polar charts

Most chart types that have two axes can be displayed as polar charts. With polar coordinates, the X axis is curved in a circle and the Y axis extends from the center of the circle to its rim. Polar charts are not a separate chart type as such, but rather a feature that can be enabled for many chart types.

Vaadin Charts offers 3 polar chart variants: POLAR, WIND ROSE AND SPIDER WEB.

Error Bar charts

Error bars display errors or outliers in statistical data. They typically represent exceptionally high or low values or deviations in data. The high and low values are represented as horizontal lines, or “whiskers”, connected by a vertical stem.

Error bars are considered to be a secondary chart type, as they are typically used in conjunction with a primary chart type, such as a scatter or column chart.

Design principles behind Vaadin Charts

Vaadin Charts are beautiful right out of the box. All charts are built using HTML5 and vector graphics based on SVG. This means they render crystal clear and sharp on any device, without any plugins. Rendering is artfully animated and user interactions with the chart itself are smooth, whether they are highlighting a series, drilling down into details or zooming.

Our team took great care to ensure that all charts are:

RESPONSIVE

Every single chart available in Vaadin Charts is designed to fit perfectly on all screen sizes. Each element in the chart scales to the optimum size and placement for the specific device, providing for a native experience for all users.

MOBILE FIRST

Vaadin Charts was built with mobile usability in mind. Our charts fit right in with any modern progressive web application.

and offer key features such as...

DRILL DOWN

You can listen to user click events for every part of the chart or show additional information describing what is under the mouse cursor. You can customize the drill-down functionality for your application right from within the visualization.

ZOOMING

Charts support zooming over both the X and Y axis to allow users to dive deeply into the details. We even offer a special timeline chart that supports lazy loading from a massive time-based dataset while zooming.

SMART TIME

Intelligent handling of the time axis is available by default. To make your data more readable and actionable, the time axis is automatically marked to indicate the start of the month or week, midnight and midday, or every full hour, for example.

DYNAMIC DATA

Data is automatically loaded from the server on demand. You can change the data on the server at any time and the chart will update with an animation.

MULTIPLE AXES

Compare different variables by assigning a different X or Y axis for each series of data. You can set independent options for each series.

Why should you choose Vaadin Charts?

DEVELOPER FREEDOM

Vaadin Charts are simple to install and can be used with any development stack, Java or otherwise. No complicated workarounds are necessary.

A RICH LIBRARY OF CHARTS

Vaadin Charts offer chart types to suit even the most niche requirements, from OHLC to polar charts.

DESIGNED TO HANDLE LARGE VOLUMES OF DATA

Vaadin Charts is currently deployed in multiple projects to visually display large volumes of human-generated, machine-to-machine, transactional and biometric data. Regardless of your chart's complexity, Vaadin Charts will keep things snappy, responsive and performant.

FULLY CUSTOMIZABLE

Vaadin Charts offer easy customization options using CSS. Modify every visual and behavioral aspect of your chart to suit your brand and business needs.

UNPARALLELED EASE OF IMPLEMENTATION

Vaadin Charts is the industry-leading charting solution for Java developers, especially for projects using Vaadin. Just import the component and it works!

How do I use Vaadin Charts?

License

The Vaadin Charts component is available exclusively for Vaadin Pro, Prime and Enterprise subscribers. To start a free trial, click here. Pricing is available here. A valid license is required to use Vaadin Charts in both Vaadin and non-Vaadin projects.

Licenses are issued **per developer,** and can be used in an unlimited number of projects.

Installation in Vaadin projects

Vaadin Charts is simple to install. Just add the `vaadin-bom` and `vaadin` Maven dependencies. Follow the detailed instructions on our dedicated Vaadin Charts page.

Installation in non-Vaadin platforms or frameworks

You can use npm, together with a build tool like Webpack, Rollup or Parcel to install Vaadin Charts as a normal web component.

Follow the brief installation instructions here, or our detailed, step-by-step tutorial on using any web component, such as Vaadin Charts, with a platform / framework of your choice here.

Configuring & using Vaadin Charts in your application

You can edit the individual charts using the API. For more information on configuring Vaadin charts, click here.

All charts included in Vaadin Charts can be styled using CSS. For guidance on styling, click here.

Experience Vaadin Charts online

We offer a comprehensive, interactive demo of all the available chart types at:
https://demo.vaadin.com/charts