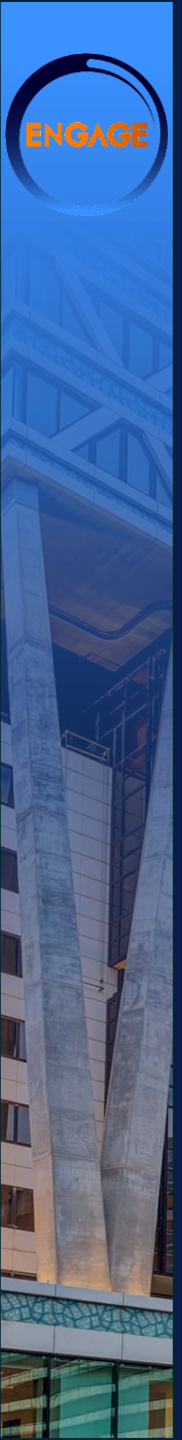
ENGAGE user group

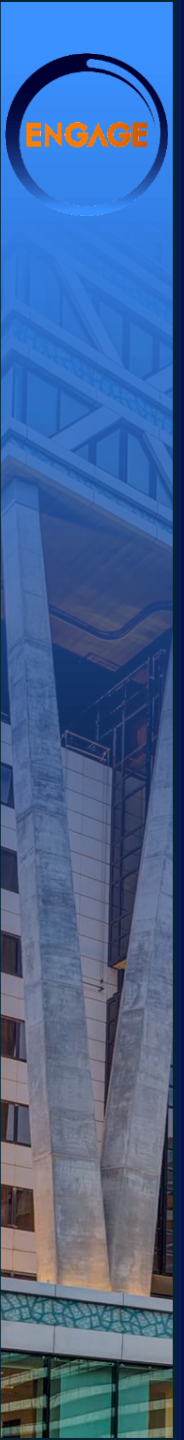
DE09: Visualize Your Domino Data with Open Source Tools

Engage 2025 – The Hague



About Richard Moy

- Managing Director of Phora Group
- Life-time IBM Champion
- Life-time HCL Ambassador
- Working with Notes since 1995
- Still a big fan of Dojo Toolkit
- Coordinator for CollabSphere for 15 years
- Grandpa
- Hiking and biking enthusiast



About Phora Group

- HCL/IBM Business Partner
- HCL Domino consultants since 2003
- Business process automation services since 2009
- Primary focused on Web-based solutions
- Over 60+ years of combined experience in Notes/Domino

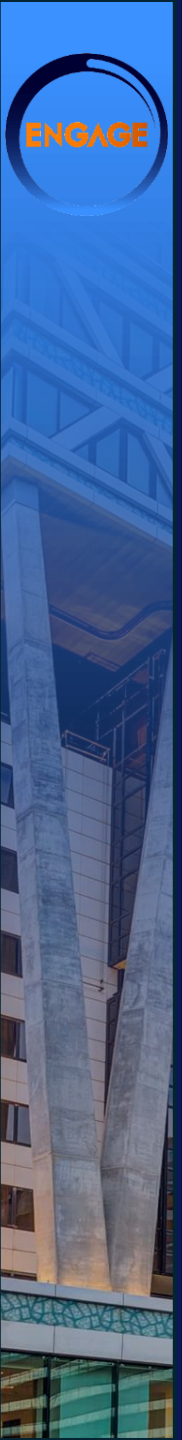
About Phora Group

Creators of the iPhora family of Domino-based products

- iPhora AppBuilder – No code application builder
- iPhora AppPlace – Place-based platform to distribute and run apps
- iPhora Automate – No code process automation platform

iPhora Automate

- Download a free 10 user version of iPhora Automate at https://iphora.io
- Try iPhora Automate on HCL SoFy
- And coming soon try iPhora Automate directly on iphora.io
- New version, v2025053101 is coming out soon.



Agenda

- Our story into data visualization
- What is data visualization?
- Available open-source visualization tools
- Considerations when selecting tools
- Demo open-source tools with Domino generated data

Our Story into Data Visualization

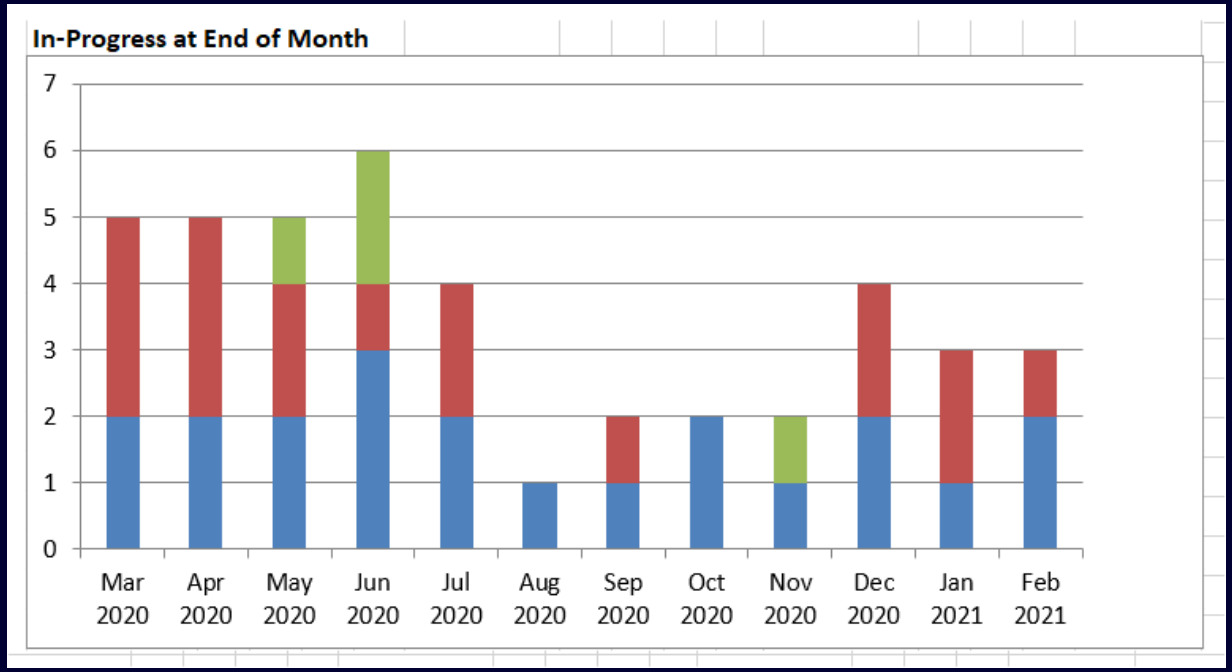
Global Equipment Manufacturer

- Dozens of key stakeholders globally
- 20+ Distributors
- 450 Suppliers

Our Story into Data Visualization

The Pain - collected data and store in spreadsheets

- Created custom spreadsheets with charts for different stakeholders
- Email spreadsheet to individual stakeholders, distributors, and suppliers



Our Story into Data Visualization

The Solution

- Created role-based dashboards that displayed information based on the needs of each stakeholder using open-source libraries
    - Bootstrap
    - ChartJS 2.0
    - Custom SVG code

What is Data Visualization

IBM Definition

“Data visualization is the representation of data through use of common graphics, such as charts, plots, infographics and even animations. These visual displays of information communicate complex data relationships and data-driven insights in a way that is easy to understand”.

Data Visualization tells a story of your data

Why Data Visualization

- Humans perceive 80% of all sensory information through our sight
- Measure and compare
- Identify trends
- Identify hidden information

Why Data Visualization

	A	B	C	D	E
1	1/1/2025	GPB Hazy Look	timquartz	62	
2	1/2/2025	GPB Imperial Stout	bobsmith	13	
3	1/2/2025	GPB Imperial Stout	miltonjones	84	
4	1/2/2025	GPB Irish Ale	karenwong	2	
5	1/2/2025	GPB Straight Up	peterwilliams	45	
6	1/2/2025	GPB Warrior	karenearl	75	
7	1/3/2025	GPB Blue Lager	timquartz	86	
8	1/3/2025	GPB Dark Nina	johndollan	89	
9	1/3/2025	GPB Hazy Look	bobsmith	22	
10	1/3/2025	GPB Hazy Look	karenwong	55	
11	1/3/2025	GPB Hazy Look	miltonjones	36	
12	1/3/2025	GPB Imperial Stout	miltonjones	90	
13	1/3/2025	GPB Zinger	timquartz	96	
14	1/4/2025	GPB Dark Nina	karenearl	76	
15	1/4/2025	GPB Imperial Stout	sandravic	78	
16	1/4/2025	GPB Irish Ale	karenearl	55	
17	1/4/2025	GPB Zinger	karenearl	21	
18	1/5/2025	GPB Blue Lager	karenearl	7	
19	1/5/2025	GPB Dark Nina	sandravic	44	
20	1/5/2025	GPB Imperial Stout	timquartz	57	
21	1/5/2025	GPB Irish Ale	johndollan	83	
22	1/5/2025	GPB Straight Up	karenwong	19	
23	1/5/2025	GPB Warrior	johndollan	99	
24	1/5/2025	GPB Zinger	timquartz	14	
25	1/6/2025	GPB Blue Lager	karenwong	98	

- How are the sales?
- Are they going up?
- Are they going down?

5 C’s of Data Visualization

- Clarity
- Conciseness
- Consistency
- Context
- Creativity

Data Visualization Best Practices

- Have a clear purpose
- Know the needs of audience
- Use visual features to show the data properly
- Consideration for accessibility, users may have issue with color

Creating Data Visualization Strategy

- Choose the right charts and graphs to tell the story
- Be consistent in your layout of your data and format.
- Use clear color cues to emphasis urgency or importance
- Incorporate contextual clues with shapes and designs
- Use size to draw the use to the level of importance
- Add text appropriately

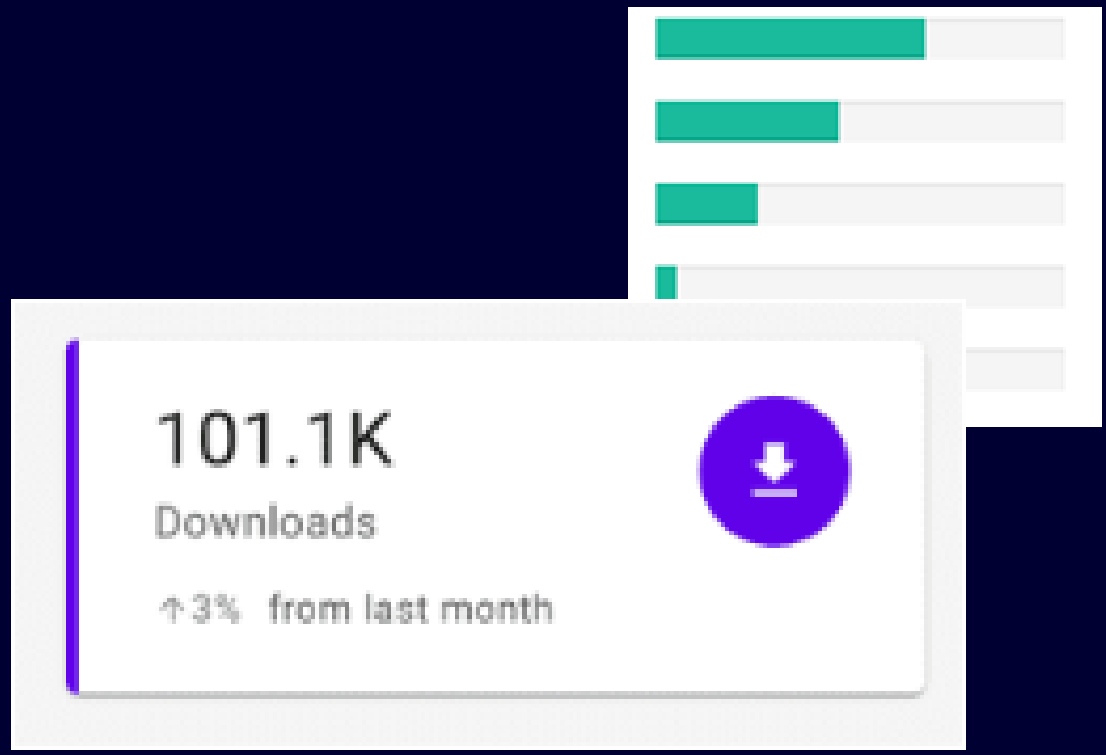
Data Visualization Methods

- Dashboards
- Counters
- Charts
- Graphs
- Maps

Bootstrap

https://getbootstrap.com/

- Counter
- Progress Bar
- Dashboard

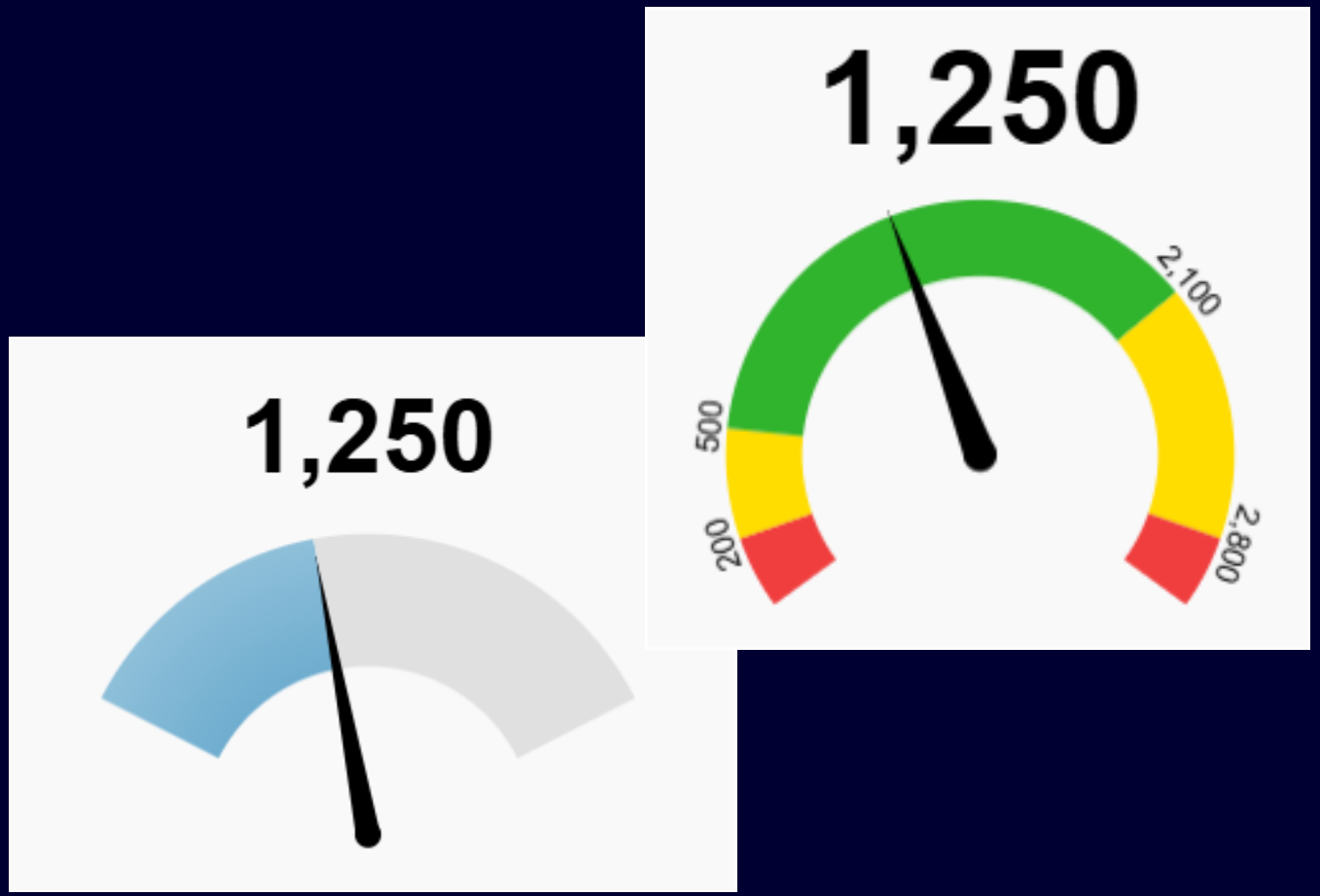


Progressbar

https://kimmobrunfeldt.github.io/progressbar.js

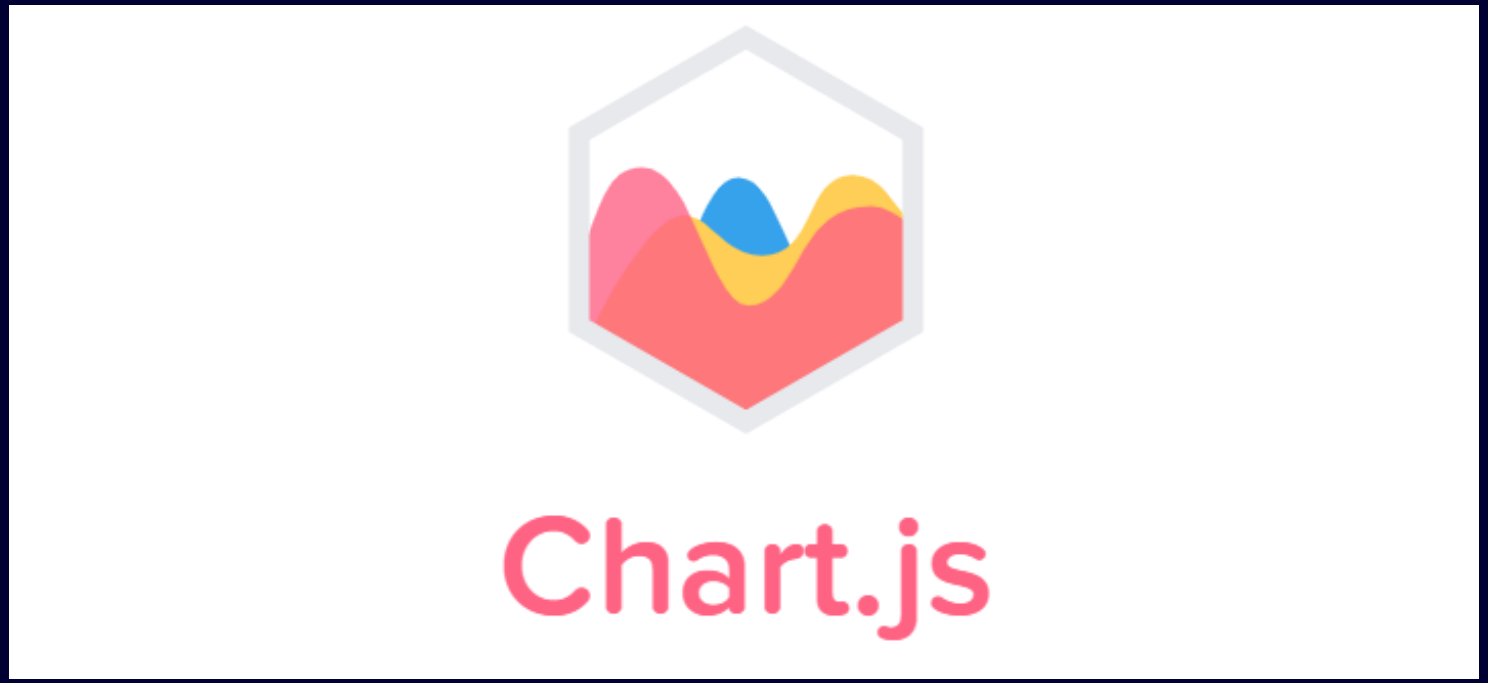
GaugeJS

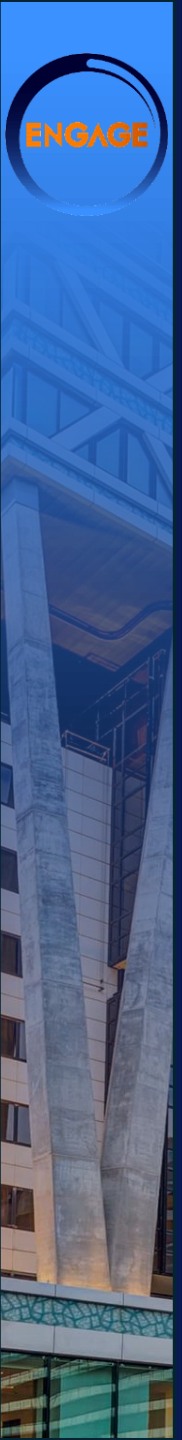
https://github.com/bernii/gauge.js



ChartJS

https://github.com/chartjs/Chart.js



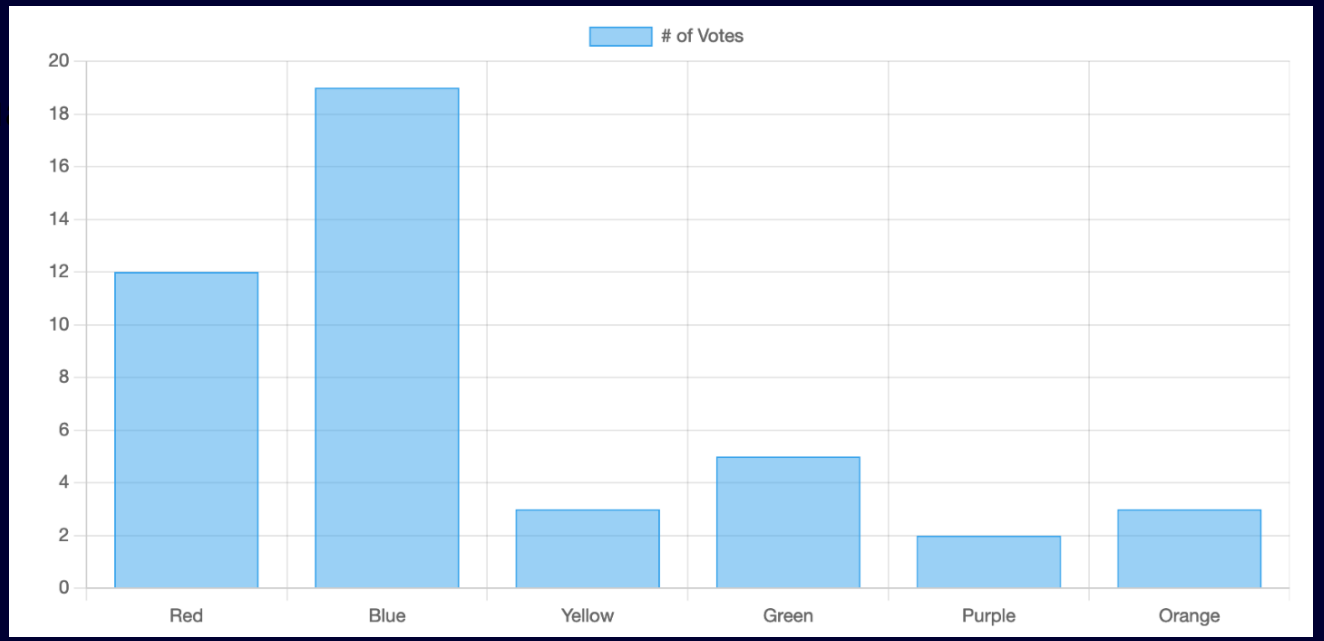


ChartJS

- Area Charts
- Bar Charts – Horizontal/Vertical - Stacks
- Doughnut Charts
- Line charts
- Mixed charts
- Pie Charts
- Plot Charts
- Scatter Charts

ChartJS Data Structure

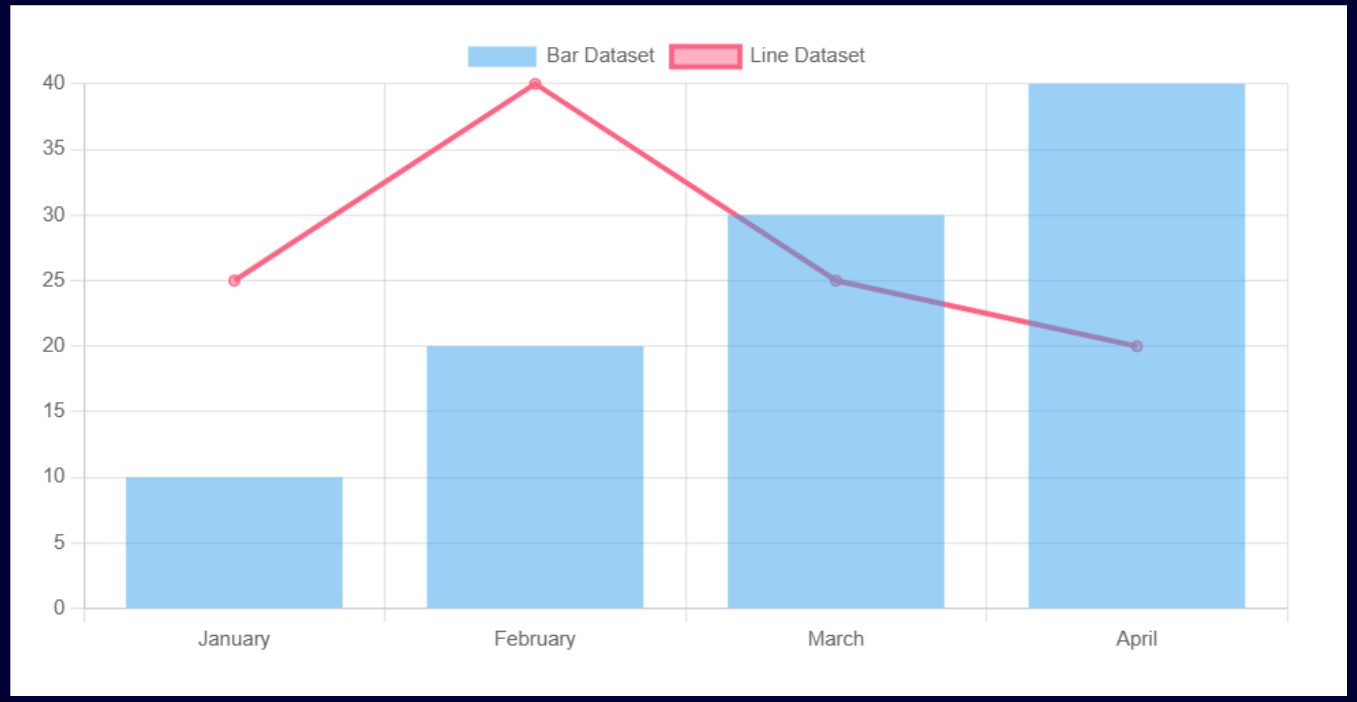
```
const ctx = document.getElementById('myChart').getContext("2d");
new Chart(ctx, {
    type: 'bar',
    data: {
      labels: ['Red', 'Blue', 'Yellow', 'Green','Purple', 'Orange'],
      datasets: [{
        label: '# of Votes',
        data: [12, 19, 3, 5, 2, 3],
        borderWidth: 1
      }]
    },
    options: {
      scales: {
        y: {
          beginAtZero: true
        }
      }
    }
});
```



ChartJS Data Structure

```
const mixedChart = new Chart(ctx, {
    data: {
        datasets: [{
            type: 'bar',
            label: 'Bar Dataset',
            data: [10, 20, 30, 40]
        }, {
            type: 'line',
            label: 'Line Dataset',
            data: [25, 40, 25, 20],
        }],
        labels: ['January’,
        'February', 'March', 'April']
    },
    options: options
});
```

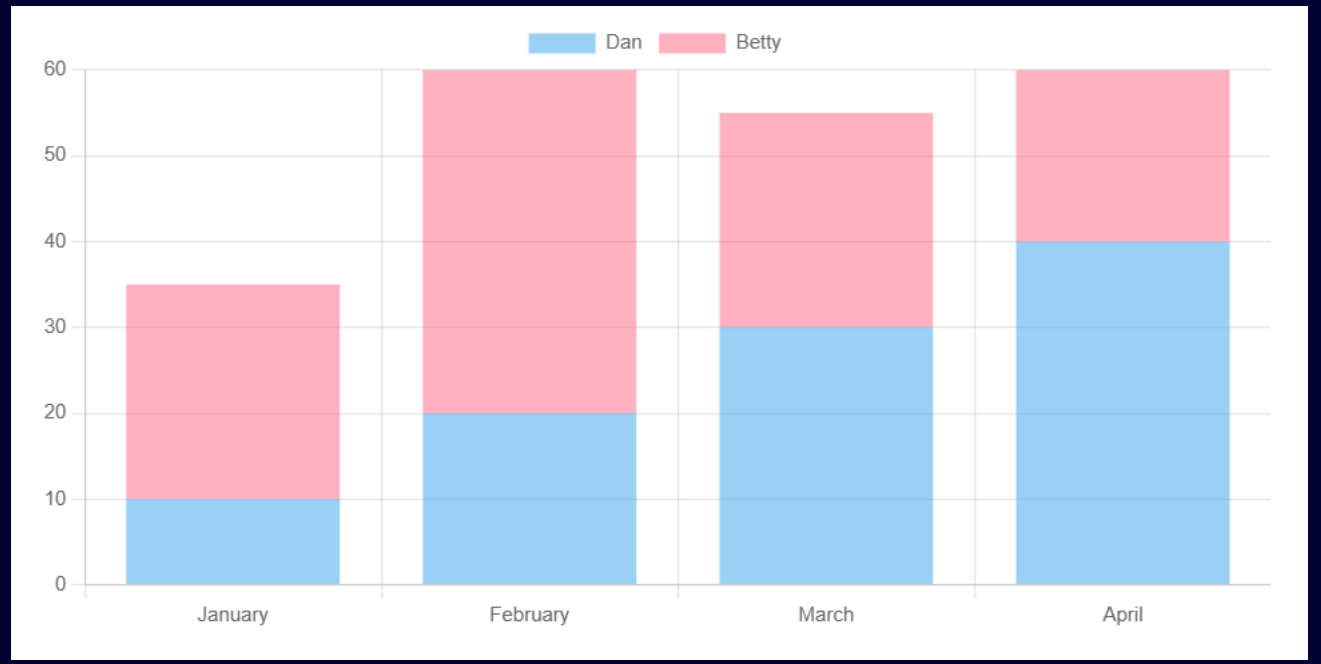
Mix Charts



ChartJS Data Structure

```
data: {
   datasets:
         [{
            label: 'Dan',
            data: [10, 20, 30, 40],
            stack:"stack 0"
         }, {
            label: 'Betty',
            data: [25, 40, 25, 20],
            stack:"stack 0"
         }],
         labels: ['January',
                  'February',
                  'March',
                  'April']
         },
         options:{
             scales: {
                 x: {
                     stacked: true
                 },
                 y: {
                     stacked: true
                 }
             }
         }
}
```

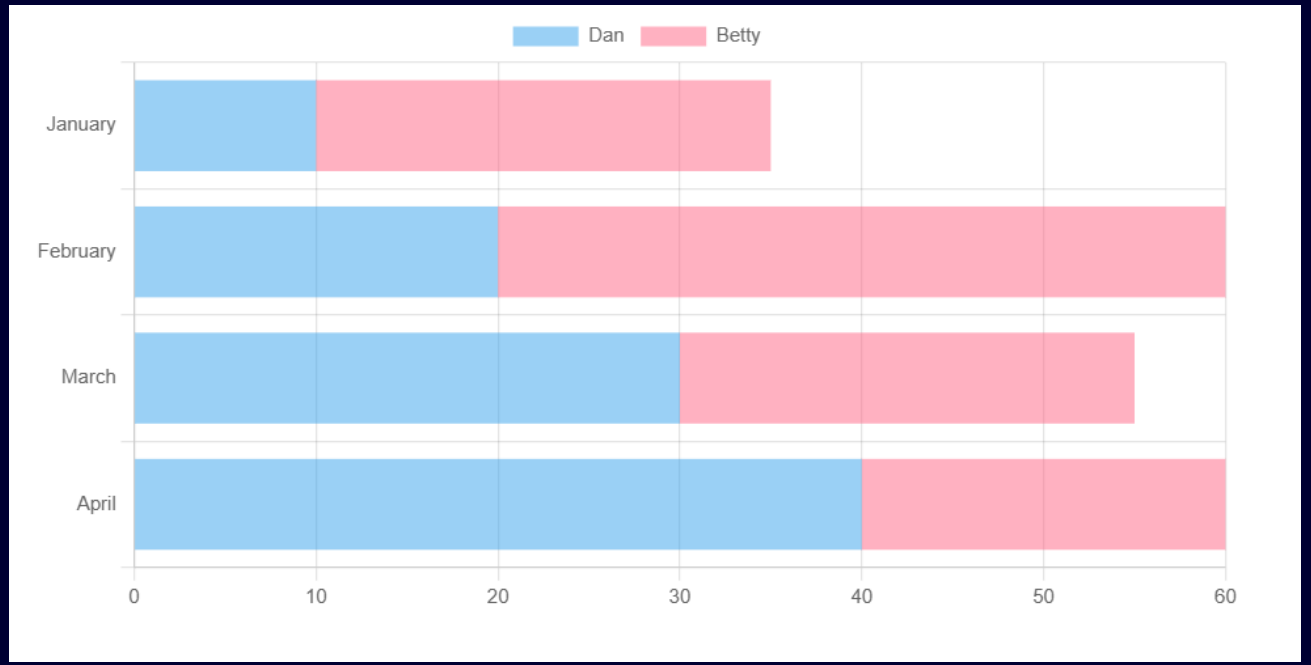
Vertical Stack Chart



ChartJS Data Structure

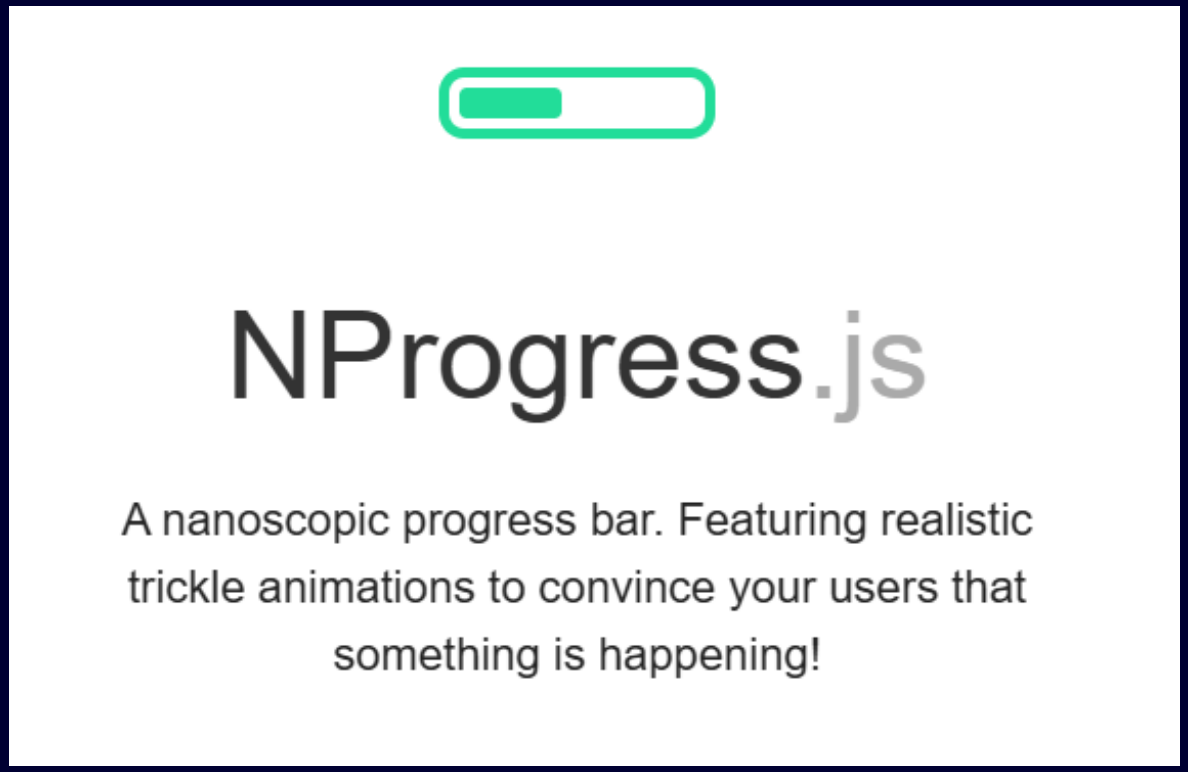
```
data: {
   datasets:
         [{
            label: 'Dan',
            data: [10, 20, 30, 40],
            stack:"stack 0"
         }, {
            label: 'Betty',
            data: [25, 40, 25, 20],
            stack:"stack 0"
         }],
         labels: ['January',
                  'February',
                  'March',
                  'April']
         },
         options:{
             indexAxis: 'y',
             scales: {
                 x: {
                     stacked: true
                 },
                 y: {
                     stacked: true
                 }
             }
         }
}
```

Horizontal Stack Chart



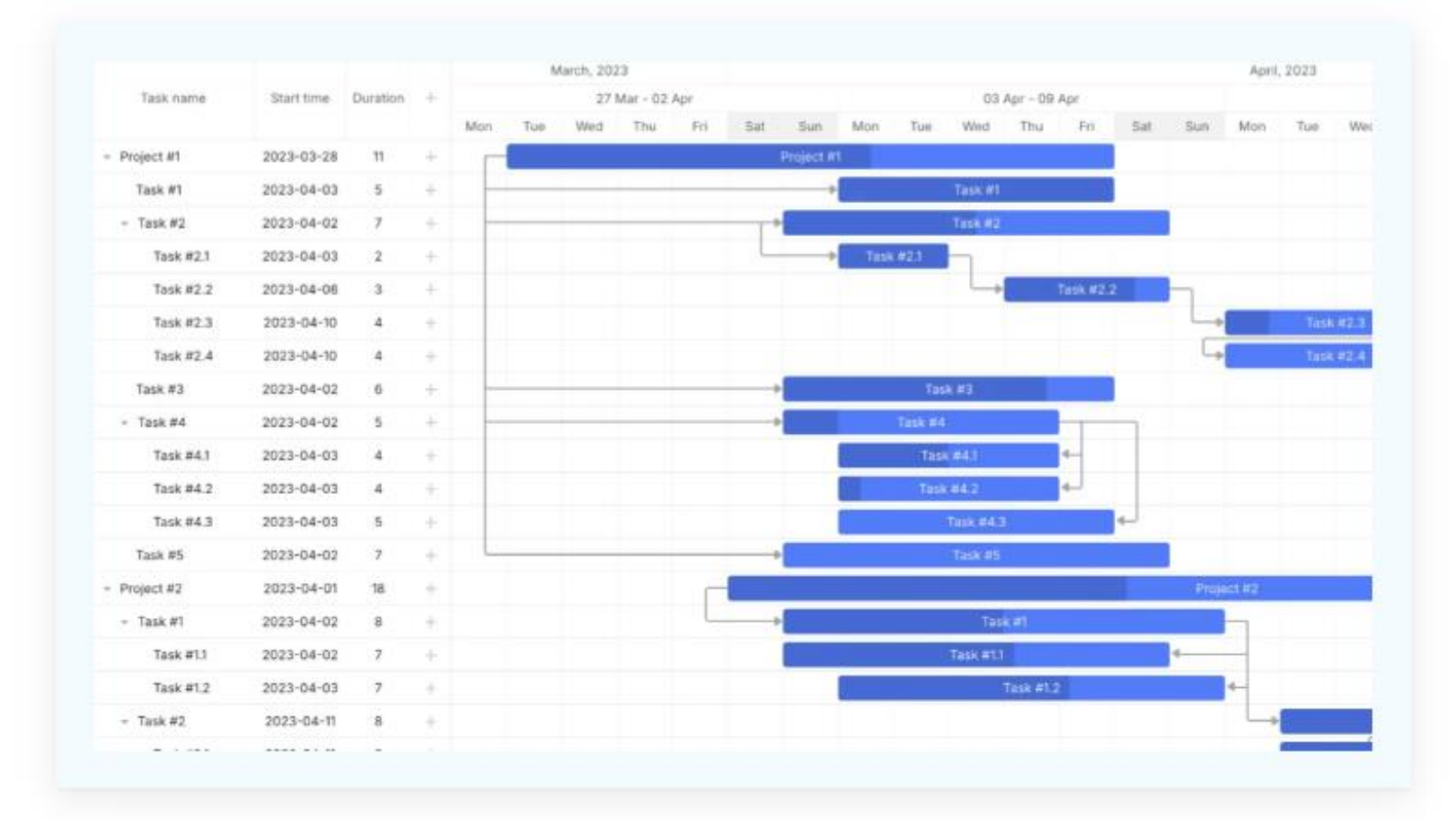
Uploading Progress

- https://github.com/rstacruz/nprogress
- Bootstrap Progress Bar



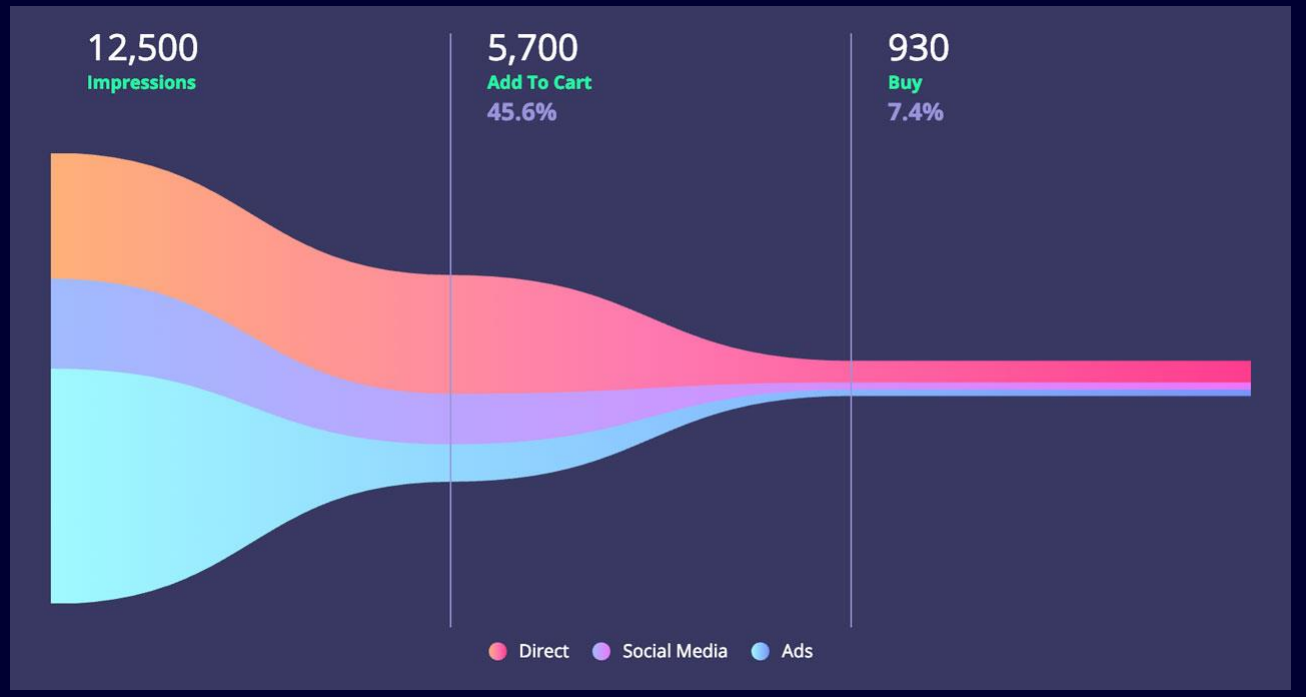
DHTMLX Gantt

https://github.com/DHTMLX/gantt



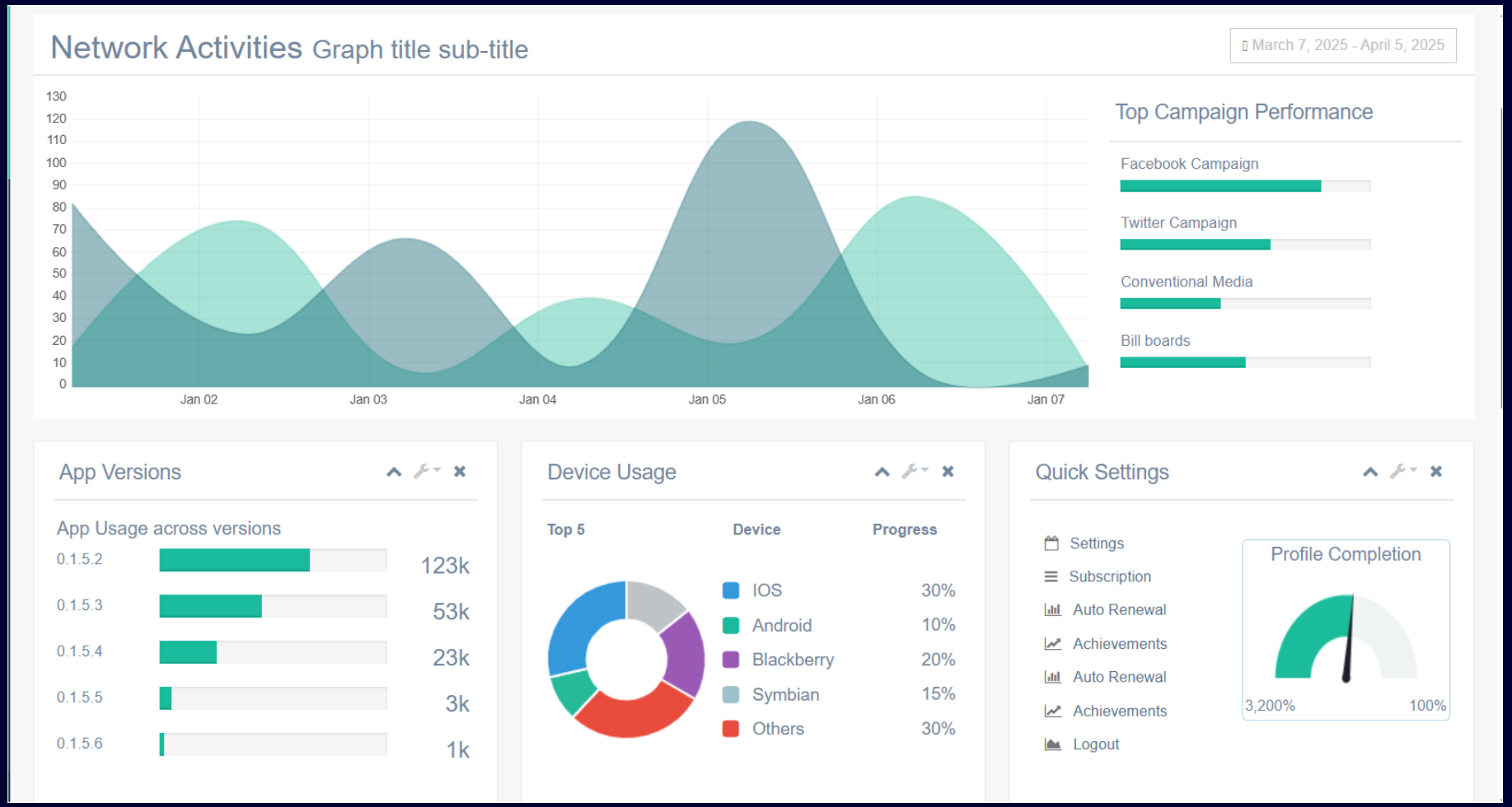
Funnel-graph

https://github.com/greghub/funnel-graph-js



ColorlibHQ

https://github.com/ColorlibHQ/gentelella



Open-Source Mapping Software

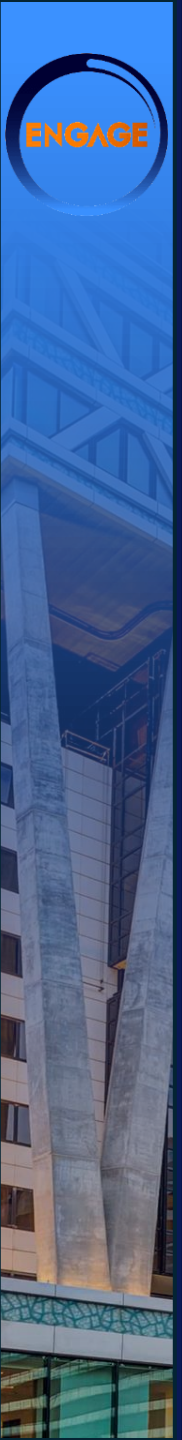
https://openlayers.org/

Open-Source Mapping Software

https://leafletjs.com/

Advanced Visualization

https://github.com/d3/d3



Built-in Visualization HTML Tags

<progress>

<meter>

Demo

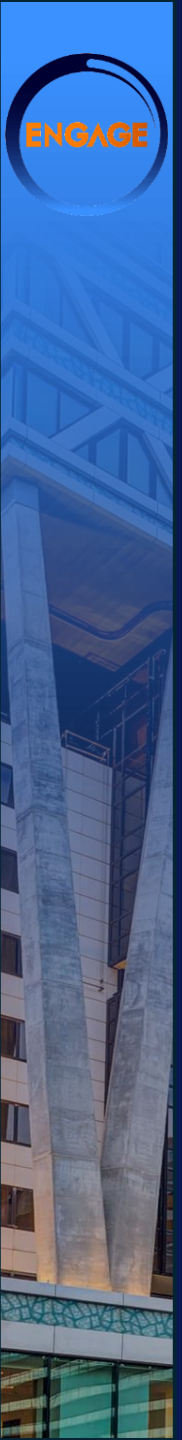
Gross Point Brewery located Evanston, Illinois

- Make 8 types of beers
- Currently have 8 salespersons
- Target Sales Goals for 2025 of $1.15 million

Domino Data Sources

There are various ways to surface your Domino data.

- Domino ?readviewentries
- XAgents
- LotusScript/Java Agents
- XPages
- Java Beans
- REST JSON API
- Formula Language
- DRAPI
- DX Objects

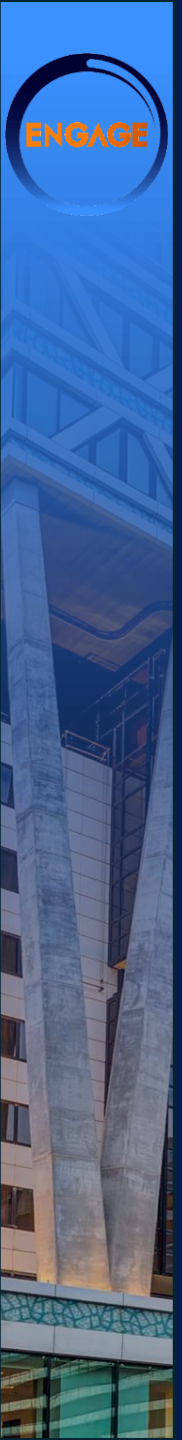


DX Objects

- Embedded LotusScript-based business objects
- Concept used in the original Domino Blog Template

Considerations When Choosing Tools

- Open Source
- MIT or BSD 3 Clause Licensing
- Server-based data source
- JSON-based data source
- Non CDN source available
- Able to run on HCL Domino platform
- Lightweight

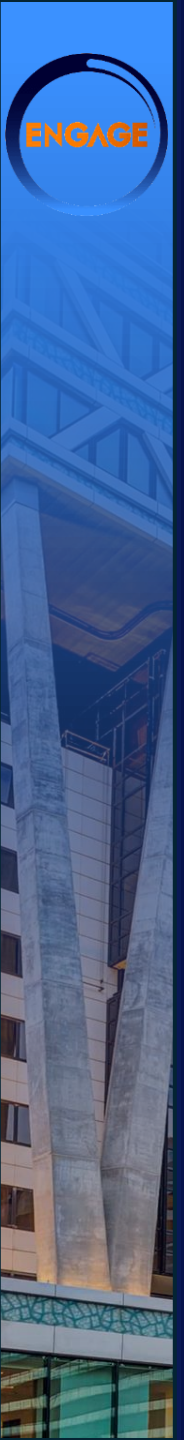


Demo

- Demo Approach
  - ES6 JavaScript
  - LotusScript
  - JSON RESTful API via fetch LotusScript Web Agents
  - DX Objects

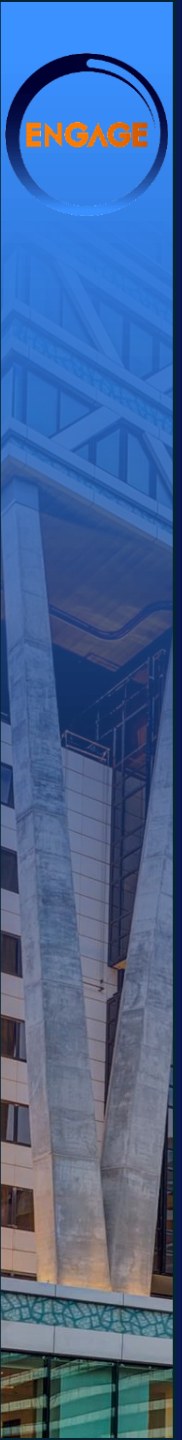
Demo - Types of Data Visualization

- Dashboards
- Interactive Grid
- Charts
- Progress Circles and Bar
- Gauge



Demo - Open-Source Projects

- Bootstrap
- Progressbar.js
- Chartjs
- Gauge.js
- nprogress.js/bprogress.js
- dhtmlxGantt
- funnel-graph



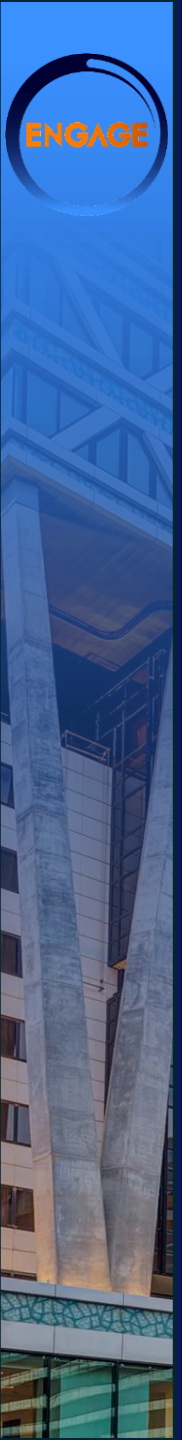
Demo Time

Demo Open-Source Project Links

- https://kimmobrunfeldt.github.io/progressbar.js
- https://github.com/chartjs/Chart.js
- https://getbootstrap.com/
- https://github.com/bernii/gauge.js
- https://github.com/rstacruz/nprogress
- https://github.com/DHTMLX/gantt
- https://github.com/greghub/funnel-graph.js

Summary

- Data visualization provides businesses a powerful tool for them to understand their data
- Depending on your needs, there are a number of open-source solutions that you can use within your Domino Web application.
- Available open-source tool are easy to incorporate into your application



My Information

LinkedIn

- https://linkedin.com/taishanworks

OpenNTF Discord Channel

Blog

- https://dominointerface.blogspot.com