Data visualization

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Author Note

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This research was made to implement different resources of data visualization in the project of WebGIS for Smart Campus and facility management oriented by Alberto Cardoso and Driss Benhaddou.

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Abstract

This paper explores the variety of data visualizations and different technologies used to bring to human eye information that is difficult or impossible to understand in large datasets and abstract base textual based information.

Maria, Sergio and Tiago(2015) affirm that the process of external cognition, using visual means (statistical charts, cartography and diagrams) provides the following: overview: Allowing understanding of what the person knows and what he or she does not know; Adjust: adjusting the level of abstraction, enables the person to change perspective on the dataset, making sense of different aspects; Detect pattern: enabling the person to usually find what he or she was looking for and which helps to gain new knowledge by finding trends, frequencies, and structures in the dataset; Match mental Model: metaphors enable an effective mapping of data by allowing users to match the visual representation of the dataset with a mental model.

Keywords: Data visualization

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It is usual to think about data visualization as a modern application in statistical graphs and charts, where it finds its wider and most common application. But in reality, the modern representation of quantitative information has deep roots, and we can trace them all the way to the earliest applications in cartography and statistical graphics. (Maria, Sergio and Tiago, 2015 p. 8)

Different technologies are being used to design a Dashboard for data visualization. One of the reasons is that connected objects and monitoring systems continuously produce data about their environment. Dashboards are then designed to aggregate and present these data to end-users.

In the table bellow, we compare the most commons solutions to visualize data, in statistical graphics and cartography.

COMPARATIVE TABLE						
Technology	Graphics	Programing Language	Interactivity (0-5)	Open source	Maps templates	Browsers
Amcharts	More than 100	Js, HTML,	4	Free for noon commercial.	Yes	All modern browsers, including mobile
Google Charts	More than 100	HTML5/SVG, JS	4	No. Use resources from Google API	Yes	All modern browsers, including mobile
Highcharts	Templates: 90 highcharts 30 highstocks 18 Highmaps	HTML, CSS and JS, SVG, VML	5	Free for noon commercial	yes	All modern browsers, including mobile
D3.js	319 templates	HTML, SVG, CSS and JS	5	Yes, but you have to pay for more resources.	Yes	All modern browsers, including mobile

Table 1: Charts Technology Comparison.
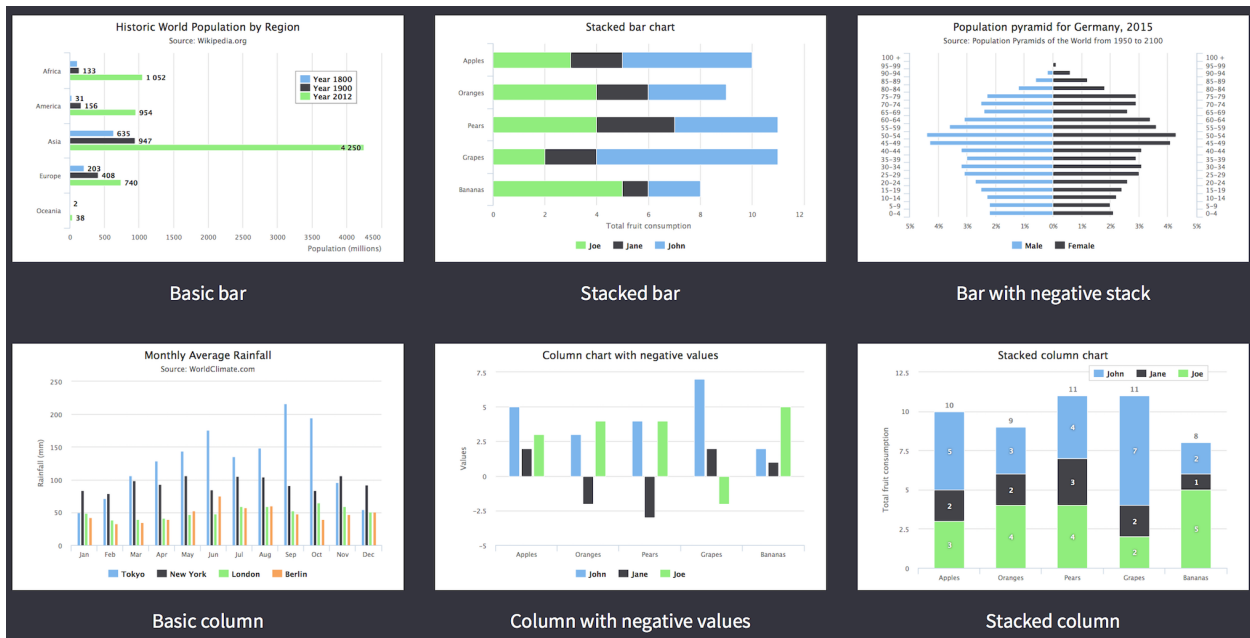
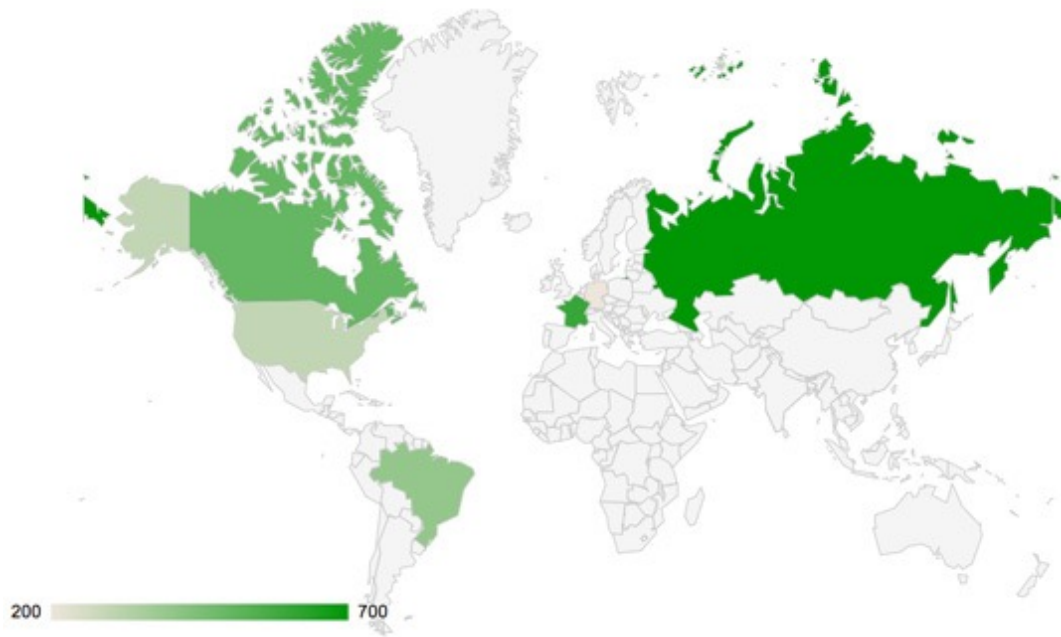Figure 1: Templates from D3Js Library.

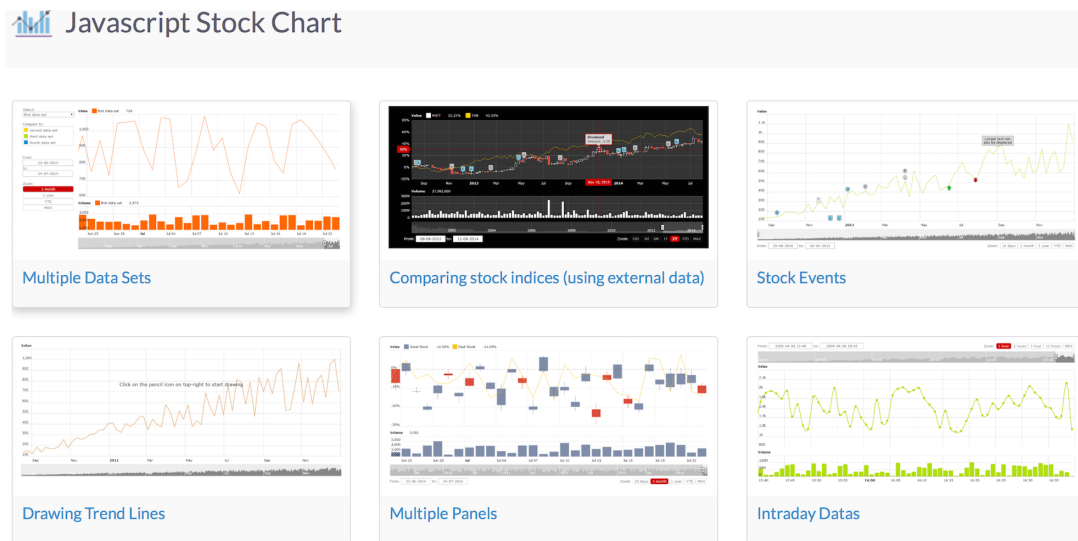Figure 2: Highcharts demo templates.

Figure 3: Google charts

Figure 4: Amchart Javascript Stock Chart templates.

Conclusion

There are a huge number of charting libraries; however, presented here are the mostly commonly used.

According to Syed Fazle Rahman(2015) "Developers who like to have all the controls over their charts will definitely opt for D3.js".

From this author's point of view, depending on type of data represented, it is important take a look at all the options and combine them to get a better representation, visualization and make the information understandable in Dashboard.

As recommendation, Amchart ranks high on data representation through maps, as well as the D3Js in statistics charts.

References
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