

There is a variety of available to visualization and some are more effective, yielding more impact than others. The first article titled, "Lessons Learned from Designing Visualization Dashboards" by Maria-Elena Froese and Melanie Tory talks about the their lessons learned from designing visualization interfaces for small-sized company to large-scale companies. Regardless of the size of the company that you are creating an application for, Data-Driven Documents (D3) will meet your needs. "D<sup>3</sup> is a novel representation-transparent approach to visualization for the web." The secondary article titled "D<sup>3</sup>: Data-Driven Documents" written by Michael Bostock, Vadim Ogievetsky, and Jeffrey Heer will go into details about the implementation.

Although data- first approach is the most common and accepted method for visualization. The data-first approach requires designers to be familiar with the characteristics and processing of data, in this case it will limit the pool of designers to those who have this expertise. "The data-first approach is at risk of designing to the data, and the mixed data-human approach is at risk of introducing data too soon, for the same reason. The design-first approach focuses on first completely solving the visualization problem visually before constraining to the data or requirements."

Design first approach on the other hand is a method that focuses on the human, without being under the influence from the data or the user requirements until a visual concept is developed. In other words, design first approach creates a bridge between data: the artifact the human uses to understand the world, and human, the consumer of the data through the

visualization. This approach offers a different perspective that can enhance or be an alternative to traditional visualization approaches, particularly for difficult visualization problems and it can also lead to new visualization innovations without being constrained by data.

To emphasize the design first approach, two case studies were created that used this approach to generate creative visualization solutions for a particularly difficult visual analytics challenge. “We chose cyber situation awareness as a topic to frame two design-first activities because of the visual analytics challenges the domain faces. Cyber data is high-volume, low-level data that needs to be interpreted for high-level tasks, such as situation awareness. The challenge is determining how to transform that low-level data into a human understandable format without losing meaning.” Some interesting results were produced by these case studies. It actually showed that the teams who integrated designers produced more innovative visualization solutions, but there were no designer-only teams. This shows that designers are more capable of producing product without given data than engineers.

The researchers in the primary article choose D<sup>3</sup> as a technical solution to implement the visual dashboard. D<sup>3</sup> was chosen as a solution because it addressed some of the challenges mentioned by Frosese and Tory. Some of the considerations were that off-the-shelf visualization construction interfaces were insufficient. For example, either the data needed too much preprocessing to be ready for those tools and/or the learning curve was too steep for the target audience. Lastly, the target audiences of the visual analytics applications were not experts in visualization or statistical reasoning. D<sup>3</sup> allowed designers to bind input data to arbitrary document elements, applying dynamic transforms to both generate and modify content. The visualization is rendered in all modern web browsers. Being available in web

browsers also make it possible for developers to use the developers tools to debug their code and interactively develop their application.

In conclusion, the primary article by Froese and Tory discusses about the lessons learned developing visualization for small-scale and large-scale company. They used D<sup>3</sup> visualization framework to implement their wireframe designs in an Agile software development approach which yielded important best practices for dashboard prototypes, porotypes and partners and end users.

**Primary Article:**

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author={M. E. Froese and M. Tory},  
journal={IEEE Computer Graphics and Applications},  
title={Lessons Learned from Designing Visualization Dashboards},  
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**Secondary Article:**

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author={M. Bostock and V. Ogievetsky and J. Heer},  
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volume={17},  
number={12},  
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keywords={Web sites;computer animation;data visualisation;document handling;user  
interfaces;Web visualization;animation;data-driven documents;document elements;dynamic  
transforms;native representation;representation-transparent approach;representational  
transparency;scene graph;standard document object model;toolkit-specific  
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