

What's behind the scenes of those cool infographics?

Professor Isabel Meirelles's lectures on last Saturday showed us many cool examples of infographics (and many of them included interactive network visualization). But how are they made of? Could we make our own easily? This activity will give you a brief backstage tour of those infographics.

Technical Components

Online infographics use a wide variety of information technologies. Each infographics application is usually custom-made for a website by a team of professional designers and computer programmers, so there isn't a single standard method to create one.

Here is a typical set of technologies that are used in most infographics applications:

- **Web browser** (e.g., Chrome, Firefox, Internet Explorer) – the software application running on your computer that renders online contents written in HTML, SVG, etc., and executes codes written in JavaScript.
- **HTML** (Hyper Text Markup Language) – a language that specifies the online contents and their formatting.
- **SVG** (Scalable Vector Graphics) – a 2D “vector image” (i.e., smooth, crisp image, unlike bitmap image) format that allows interactivity and animation.
- **JavaScript** – a computer programming language that can be embedded in a webpage and run by a web browser. Such JavaScript codes can produce dynamic HTML and SVG contents on the fly.
- **D3.js (Data-Driven Documents; <http://d3js.org/>)** – a JavaScript library for data visualization and infographics. It was developed fairly recently (first release in 2011) but has already become very popular for creating interactive infographics.
- **JSON (JavaScript Object Notation)** – a standard format for describing data in a human-readable manner. Despite its name, it doesn't depend on JavaScript, and in fact it is very similar to data structures used in Python.

These technological components are combined together as shown in the figure on the next page.

Each of the above technologies would easily take a semester or two of coursework to master, so we can't learn them all in an hour. Instead, we will take an approach to read, understand and modify stuff already written by others (a great way to learn new languages ;).

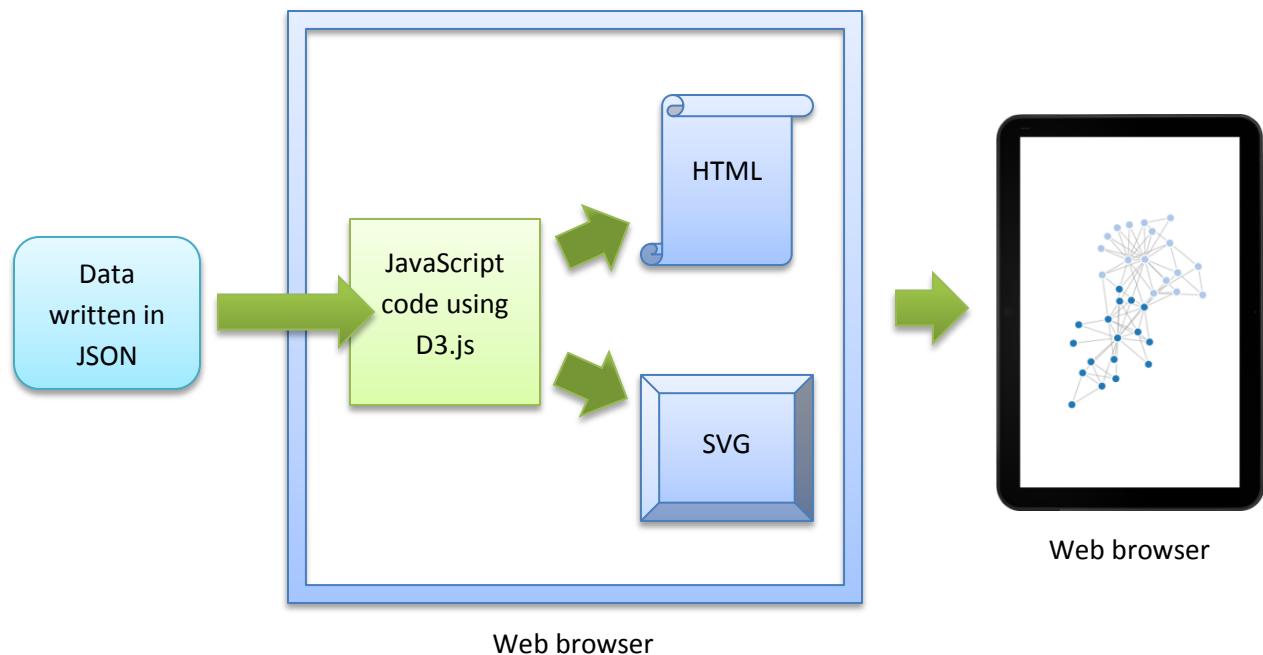


Figure: How various technologies are typically integrated for an infographics website

Infographics Examples

Fortunately, Mike Bostock, one of the developers of D3.js, publishes a number of simple yet very effective infographics examples on his website:

<http://bl.ocks.org/mbostock>

Spend some time exploring this website. You will find tons of really cool visualization examples! Most of them come with the actual JavaScript codes that are ready for use.

Examples that are particularly simple and useful for network visualizations include:

Force-Directed Graph <http://bl.ocks.org/mbostock/4062045>

Curved Links <http://bl.ocks.org/mbostock/4600693>

Try below:

- Mouse-over on nodes to see their names.
- Click and drag a node to manipulate the shape of the network.
- Read the “index.html” section on the web page and figure out which part specifies the data file (*hint: it contains “json”*).
- Read the “miserable.json” section on the web page and learn the data format.

Create Your Own Network Infographics

Let's copy and modify either "Force-Directed Graph" or "Curved Links" example to create your own infographics!

First, copy the "index.html" section. Open a text editor (such as Notepad in Windows) and paste the copied text into it. Then save it as "index.html" on your desktop. Make sure it was not saved as "index.html.txt".

Second, do the same for the "miserables.json" section (available on the "Force-Directed Graph" page) and save it as "miserables.json".

Then, open "miserables.json" again using your text editor, and start modifying its content as you like. The "group" tag means the color of the node, while the "value" tag means the thickness of the link (i.e., connection strength). You can change it freely as you want. You can add more nodes/edges or remove existing nodes/edges. But make sure you always stick to its original JSON data format.

Once the editing is over, double-click on the "index.html" file. If you are using Firefox, the edited infographics may run immediately without any additional action needed. If it doesn't run on your browser, this may be because your browser does not allow you to have access to local files due to security reasons. If this is the case, email your "miserables.json" data file to sayama@binghamton.edu so I can upload your data to my personal website, from which your browser should be able to run your code.



Wanna Be a Bit More Advanced?

You can generate your own .json data from Python/NetworkX by doing the following:

```
import networkx as nx
from networkx.readwrite import json_graph
g = # generate your Graph data here
print json_graph.node_link_data(g)
```

You will probably need to do further editing of the result in your text editor in order to use it for the above infographics examples, such as adding "groups"/"values" tags and changing single quotes (') to double quotes ("), etc.

Some more advanced examples of network infographics can be found here:

<http://flowingdata.com/2012/08/02/how-to-make-an-interactive-network-visualization/>