Visualising City Data on the Web with FOSS

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Building City Dashboards
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Building City Dashboards

Data | Visualization & Interaction | Analytics & Modelling

Goal: distributable FOSS codebase to facilitate rapid prototyping of custom city dashboards

Low cost, low maintenance

Inform best practice

Specify framework
Dashboards Redesign

Informed by user research

Modular visualization components fit within the overall website structure
Design

**Explanative**  
(communication of insights)

**Explorative**  
(discovery of patterns)

**Increasing Visualization Complexity**

**Novice | Casual**

**Data stories**

**End-user | Professional**

**Dashboard (fast chart)**

**Advanced | Professional**

**Analytic (slow chart)**

**Increasing Contextual Information**
Approach

• Linked interactive visualizations of various types including maps and geospatial, with contextual information in the form of adaptive text.

• Levels of complexity/ sophistication to cater to multiple user types and tasks.

• A single common programming technology; client-side rendering with JavaScript (offers benefits for small teams e.g. JS software stack)
Dublin Health Centers

The map shows the locations of a variety of health service types across the county, including hospitals, pharmacies, dentists etc.

Currently showing **638** general practitioners out of a total of **1,463** health locations.
Dublin Hospital Waiting Lists

The chart currently shows waiting periods over time for Diabetes Mellitus, at St. James’s Hospital, for patients aged 16-64 years.

Do you have an upcoming treatment or procedure? You can see how long people have waited for it by selecting options from the menus below.

Choose your treatment type or specialization:

Reset
Diabetes Mellitus: 210

Choose your age range below:

Reset
16-64: 210

Choose a hospital:

Reset
St. James’s Hospital: 210
Workflow for Client-Side Prototyping

Offline data cleaning and preparation – **OpenRefine**

Data import – **d3.js, AJAX**

Data manipulation – **d3.js, crossfilter.js**

Map creation – **Leaflet, OpenStreetMap**

Chart creation – **d3.js, dc.js, chart.js, plotly.js**

Styling, layout, interaction – **HTML, CSS (grid), JavaScript**
The Good

FOSS
High quality graphics and interaction
Extensibility, ‘leaky abstractions’, SVG and JS underpinning
Community

The Bad

Learning curve, requires JavaScript and web knowledge
Versioning; often deprecates features, breaks older code (e.g. D3)
Crossfilter and dc.js;
  Not easy to create charts which are not part of the standard set
Limited documentation
Data-wrangling e.g. NaNs in your dataset will cause problems.
Resources

Crossfilter & dc.js

https://github.com/crossfilter/crossfilter/wiki
https://github.com/crossfilter/crossfilter/wiki/Crossfilter-Gotchases
http://animateddata.co.uk/articles/crossfilter/
https://dc-js.github.io/dc.js/docs/stock.html
https://www.codeproject.com/Articles/693841/Making-Dashboards-with-Dc-js-Part-1-Using-Crossfilt

D3.js

https://d3js.org/
Coming soon:

https://dashboards.maynoothuniversity.ie/#the-blog

Thanks!

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@ffrink  

@dashbuild