

Google™

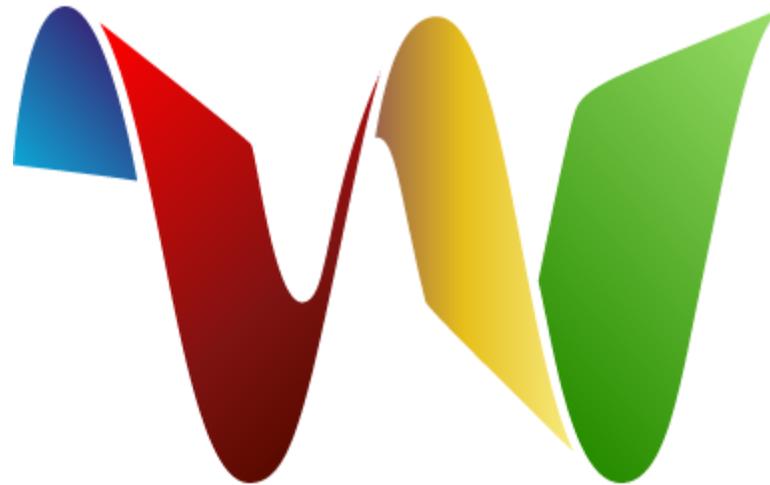


Michael Fink – Product Manager  
Amit Weinstein – Eng. Lead

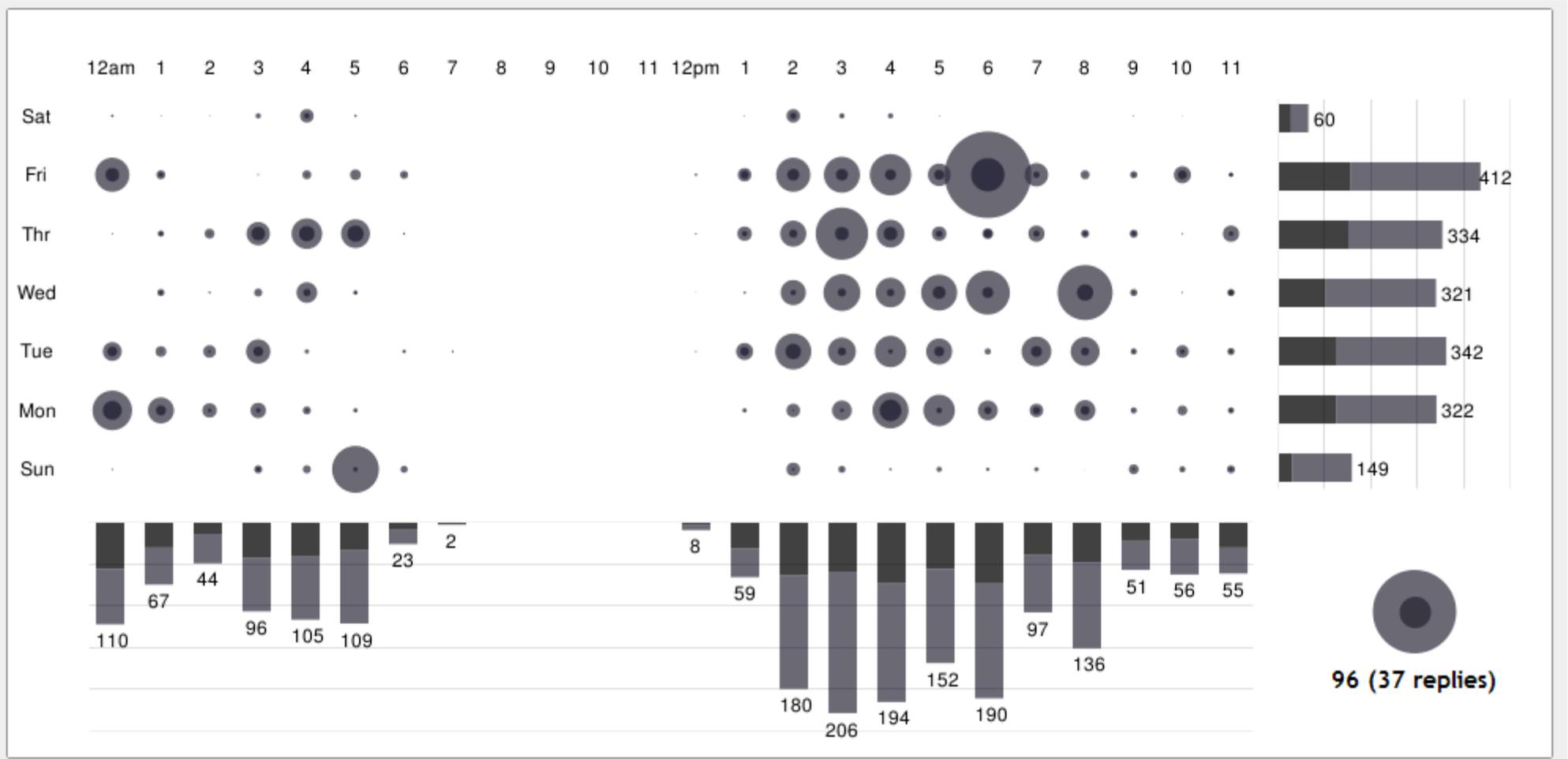
# GOOGLE CHART TOOLS: GOOGLE'S UNIFIED APPROACH FOR CREATING DYNAMIC CHARTS ON THE WEB

Follow this talk at ...

<http://bit.ly/99tmxi>



# Tweet patterns across day and time



# Google Chart Tools

**mission:** make the world's structured data universally accessible & useful by providing enticing visualizations



charts

**Part 1:** Image charts - server side rendering

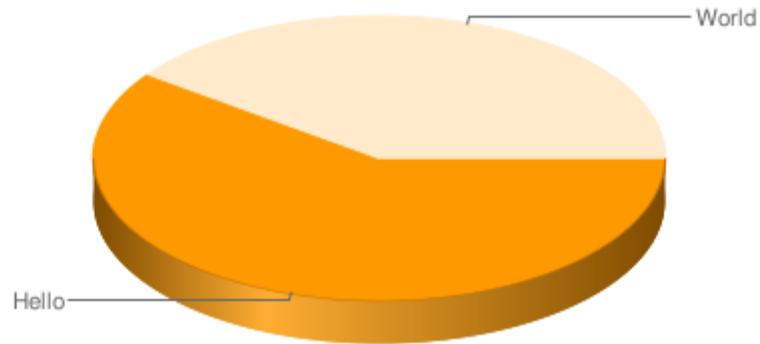
**Part 2:** Interactive charts - client side interactivity

**Part 3:** “Under the hood”

**Part 4:** Combining server side rendering with client side interactivity

# PART 1: IMAGE CHARTS

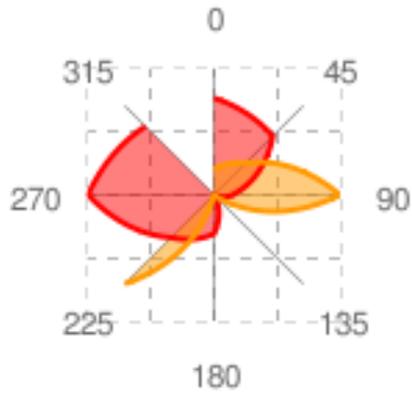
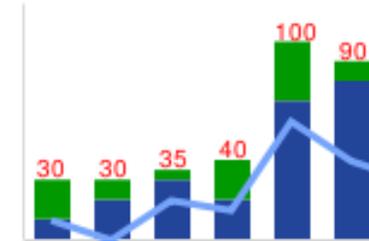
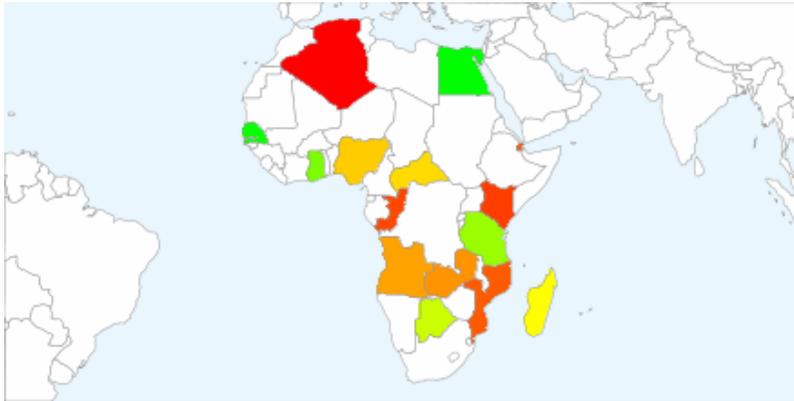
# Image Charts



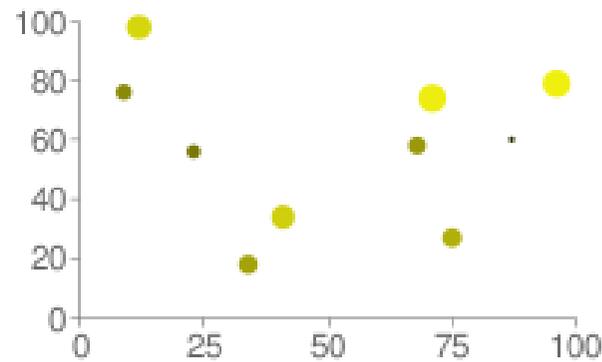
```
chs = 500x200  
cht = p3  
chd = t:60,40  
chl = Hello|World
```

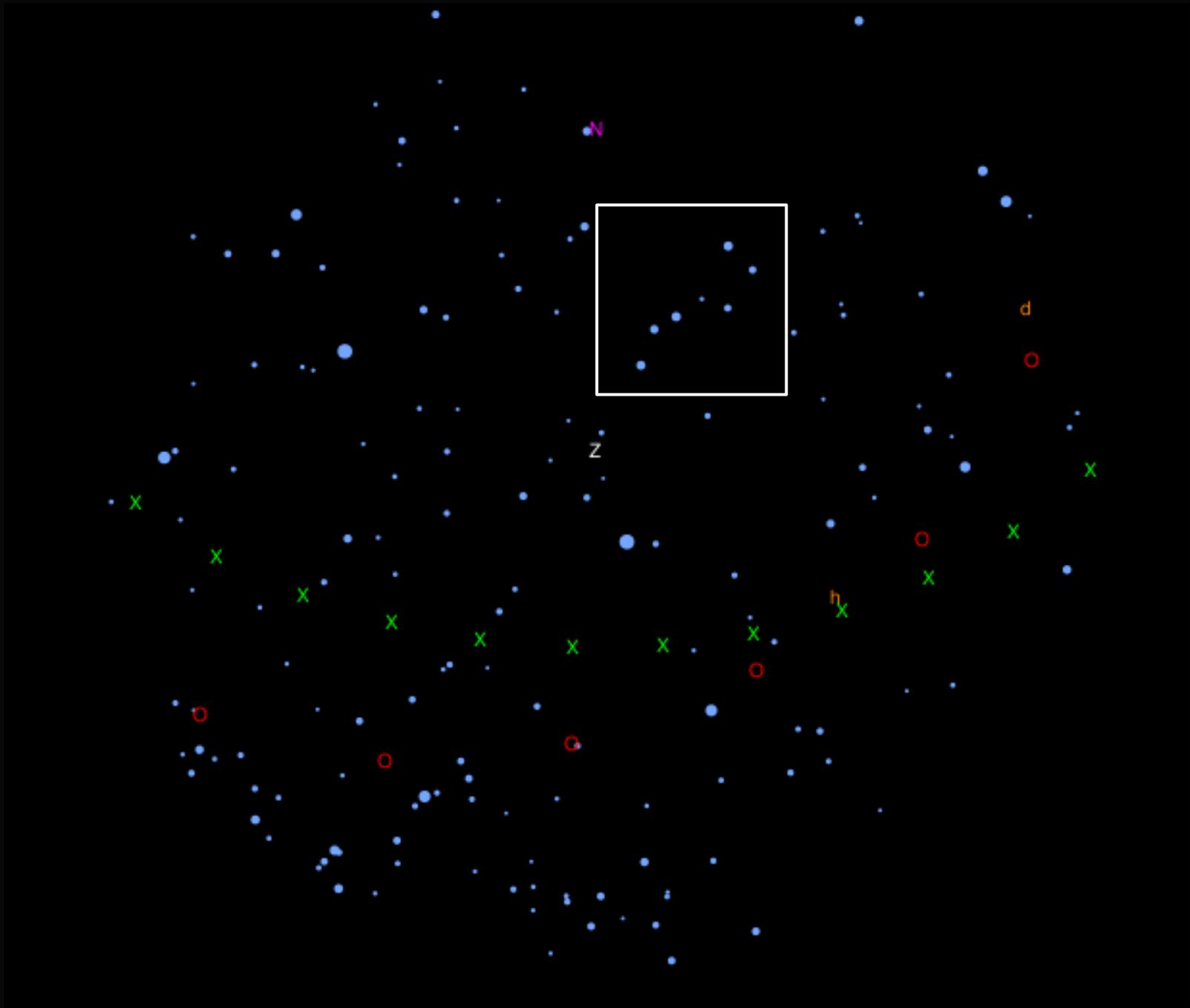
<http://chart.apis.google.com/chart?chs=500x200&chd=t:60,40&cht=p3&chl=Hello|World>

# Image Charts



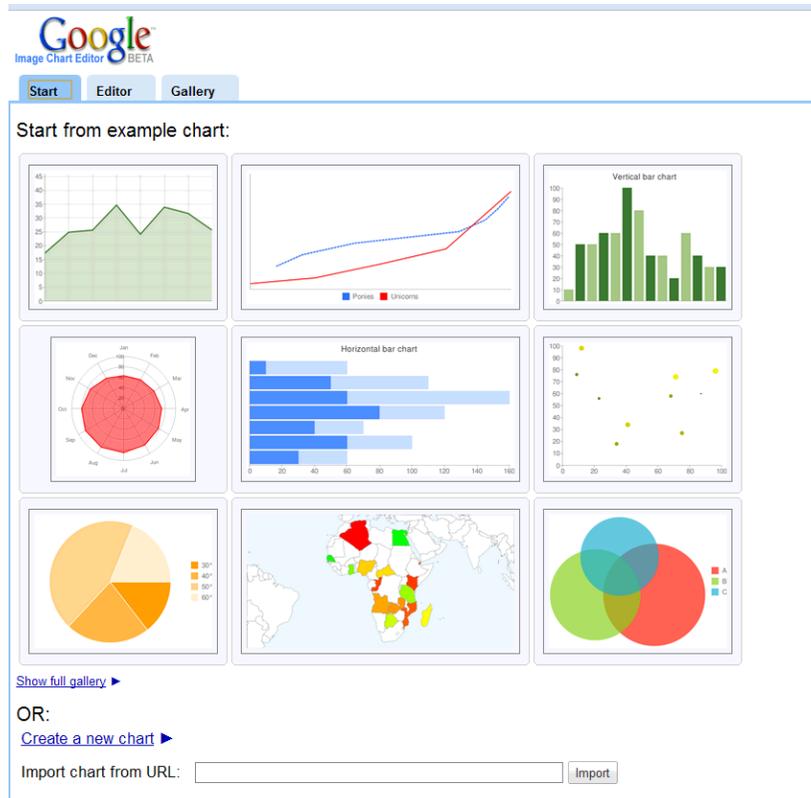
Average Electric Usage





# Image Charts

- Step 1: image chart editor

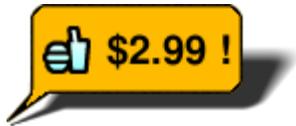


The screenshot shows the Google Image Chart Editor interface. At the top, there is the Google logo and the text "Image Chart Editor BETA". Below the logo are three tabs: "Start", "Editor", and "Gallery". The "Start" tab is selected. Underneath, there is a section titled "Start from example chart:" followed by a grid of nine different chart types: a line chart, a line chart with two series (Ponies and Unicorns), a vertical bar chart, a radar chart, a horizontal bar chart, a scatter plot, a pie chart, a world map, and a Venn diagram. Below the grid, there is a link "Show full gallery" and the text "OR: Create a new chart". At the bottom, there is a field "Import chart from URL:" followed by an "Import" button.

- Step 2: generate programmatically using PHP / JavaScript

# Rendering service...

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$



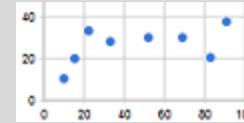
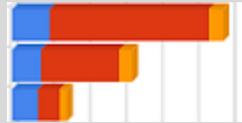
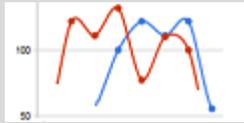
**Barcelona**

 max 25°C  
min 15°C

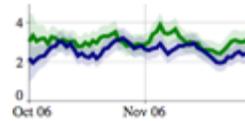
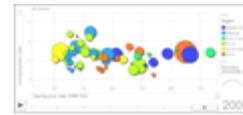


# PART 2: INTERACTIVE CHARTS

# Our chart gallery – a community effort

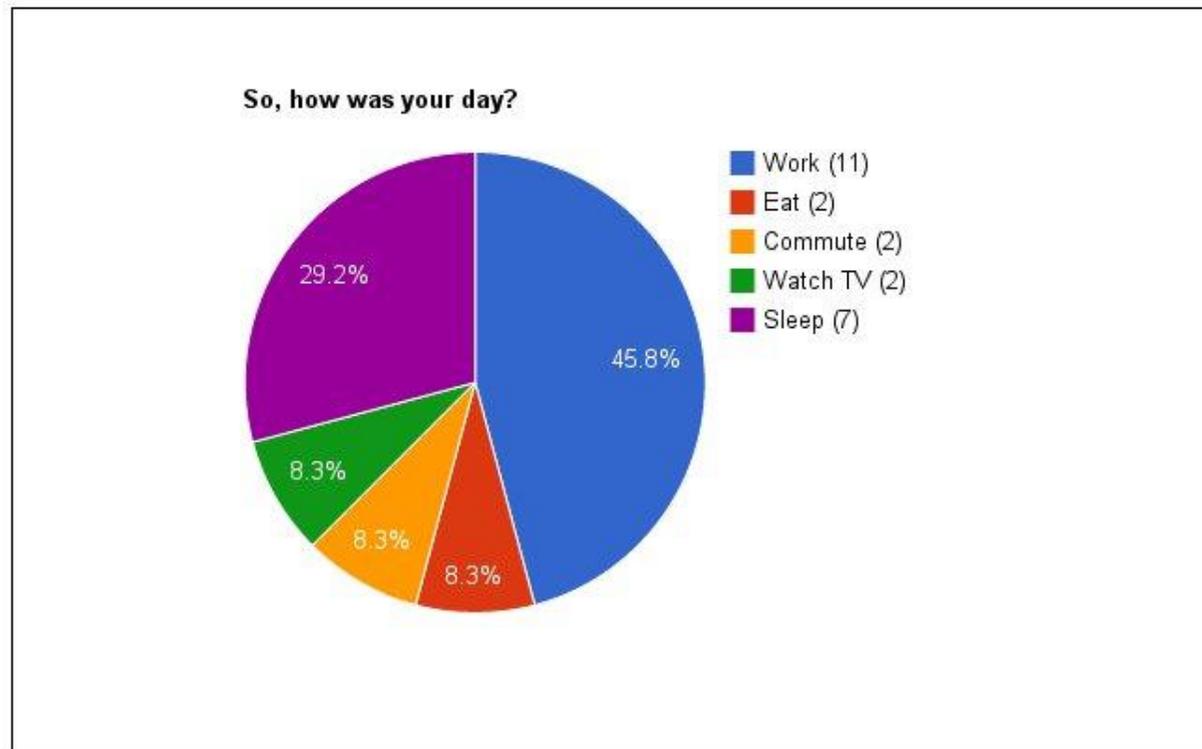


Term Cloud



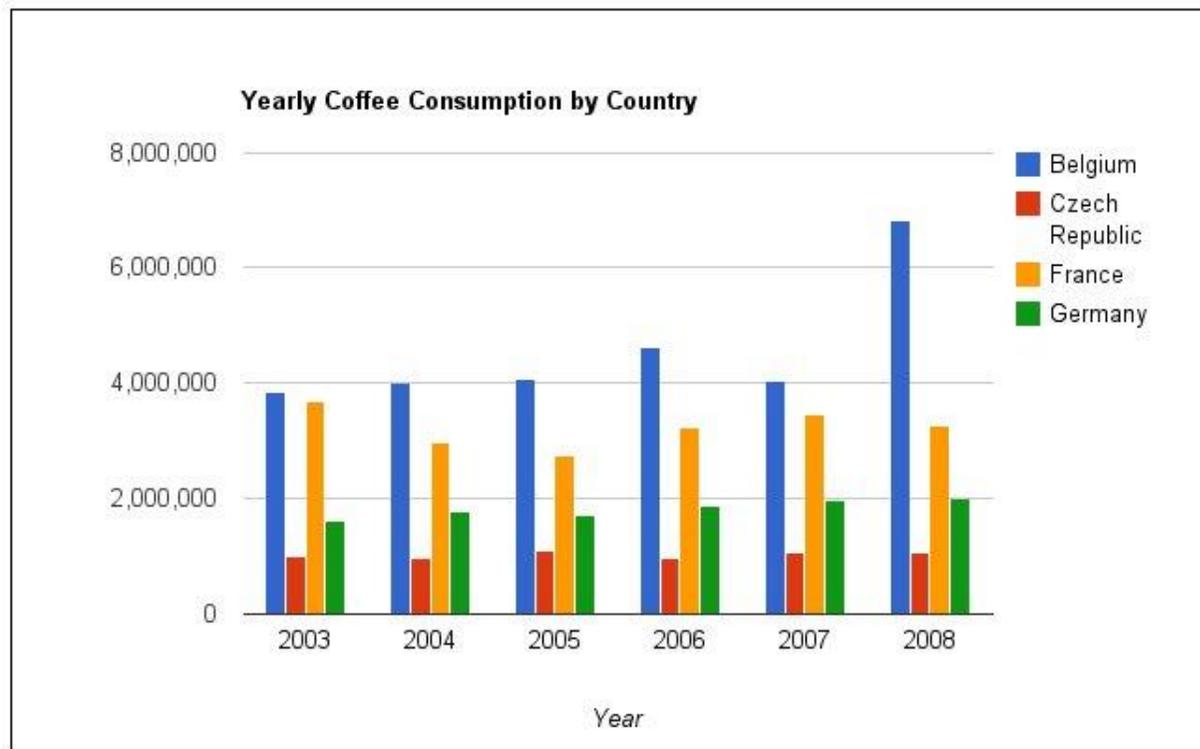
# Interactive charts – new design

- New look and feel
  - Color palette



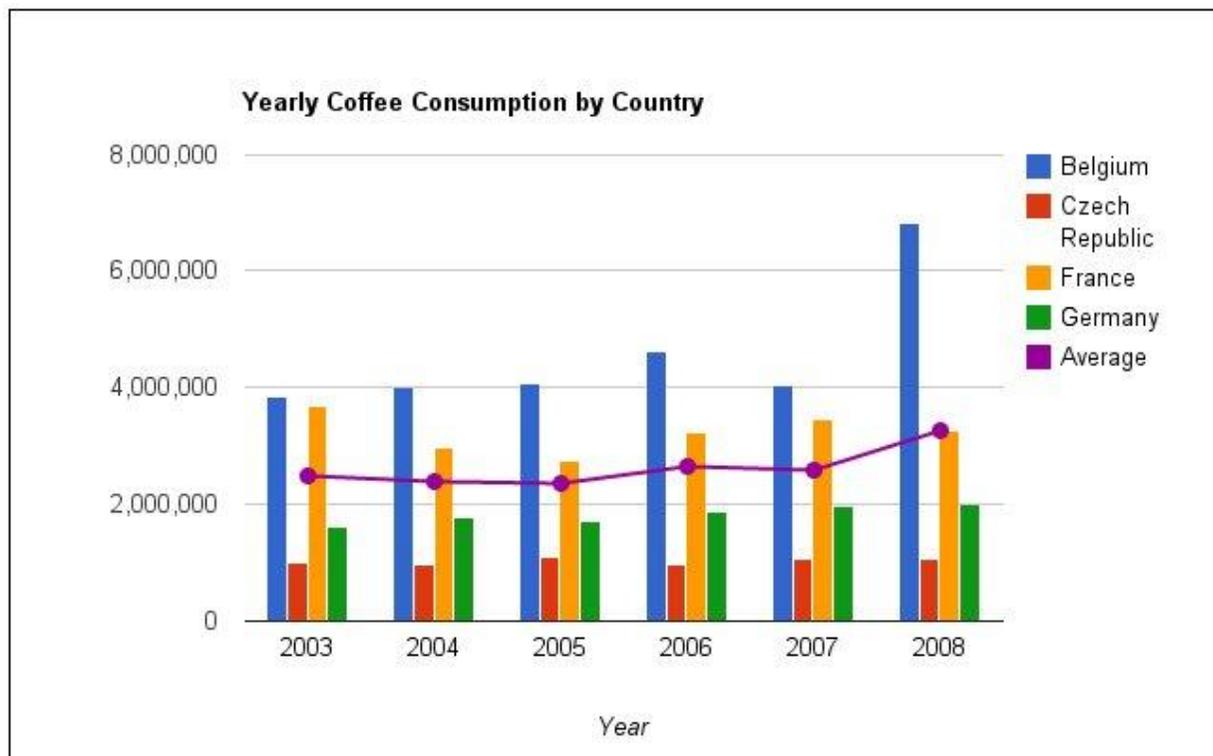
# Interactive charts – new design

- New look and feel
  - Color palette
  - Chart layout



# Interactive charts – new design

- New look and feel
  - Color palette
  - Chart layout
- New chart combinations



# Demo site: BackPaki

DESTINATIONS | GEO | GENDER | PRICE | BALL |  
SOCIAL | BUDDIES | FRIENDS ON MAP |

### MAP

	short_name	parent	primary	price	gender	age	
41	Marshall Islands	World	36	40	33	24	
42	Martinique	World	51	44	23	7	
43	Mauritania	World	81	79	52	3	
44	Mauritius	World	40	49	99	11	
45	Mayotte	World	67	1	4	48	
46	Mexico	World	52	6	73	10	MX
47	Oaxaca	Mexico	34	14	48	74	MX-OAX
48	Michoacan	Mexico	2	41	93	21	
49	Mexico DF	Mexico	13	2	28	61	
50	Quintana Roo	Mexico	10	66	94	71	
51	Yucatan	Mexico	10	19	65	32	
52	Puebla	Mexico	20	51	46	36	
53	Tijuanna	Mexico	30	58	53	55	
54	Guadelajara	Mexico	30	24	80	36	
55	Chiapas	Mexico	10	53	31	97	
56	British Columbia	Canada	123	85	82	97	
57	Ontario	Canada	21	12	56	61	

### NEWS AND EVENTS

Finalists of the Backpaki Photo of the Week BPOW competition:



"Steps" by  
tenant81@backpaki.com



"Woods" by Lesley  
from NSW Australia

### STATS



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# Interactive Charts: configure options

Google code Code Playground [Tell us what you think](#) | [Sign in](#)

Pick an API

- Visualization
  - Basics
    - Annotated Time Line
    - Area Chart
    - Bar Chart
    - Column Chart
    - Gauge
    - Geo Map
    - Image Chart
    - Image Area Chart
    - Image Candlestick Chart
    - Image Line Chart
    - Image Pie Chart
    - Intensity Map
    - Line Chart
    - Motion Chart
    - Org Chart
    - Pie Chart
    - Scatter Chart
    - Sparkline
    - Table
  - Advanced
    - Annotated Time Line Configuration

Basics » Geo Map [View Docs](#) [Edit HTML](#)

```
1 function drawVisualization() {
2   var data = new google.visualization.DataTable();
3   data.addRows(6);
4   data.addColumn('string', 'Country');
5   data.addColumn('number', 'Popularity');
6   data.setValue(0, 0, 'Germany');
7   data.setValue(0, 1, 200);
8   data.setValue(1, 0, 'United States');
9   data.setValue(1, 1, 300);
10  data.setValue(2, 0, 'Brazil');
11  data.setValue(2, 1, 400);
12  data.setValue(3, 0, 'Canada');
13  data.setValue(3, 1, 500);
14  data.setValue(4, 0, 'France');
15  data.setValue(4, 1, 600);
16  data.setValue(5, 0, 'RU');
17  data.setValue(5, 1, 700);
18
19  var geomap = new google.visualization.GeoMap(
20    document.getElementById('visualization'));
```

Output [Debug Code](#) [Run Code](#)

©2009 Google - [Code Home](#) - [Site Terms of Service](#) - [Privacy Policy](#) - [Site Directory](#) - [Report Bug](#)

But I want it in brown  
{'colors':[0xFFFFF,0xAA6622]}

DESTINATIONS | GEO | GENDER | PRICE | BALL |  
SOCIAL | BUDDIES | FRIENDS ON MAP |

NEWS AND EVENTS  
Finalists of the Backpack Photo of the Week BPOW competition:  
  
"Steps" by [tenantant51@backpacki.com](#)  
  
"Woods" by Lesley from NSW Australia

short_name	parent	primary	price	gender	age
41 Ivorianian Ivorianian	World	26	40	33	24
42 Martinique	World	51	44	23	7
43 Mauritania	World	81	79	52	3
44 Mauritius	World	40	49	99	11
45 Mayotte	World	67	1	4	48
46 Mexico	World	52	6	73	10 MX
47 Oaxaca	Mexico	34	14	48	74 MX-OAX
48 Michoacan	Mexico	2	41	93	21
49 Mexico DF	Mexico	13	2	28	61
50 Quintana Roo	Mexico	10	66	94	71
51 Yucatan	Mexico	10	19	65	32
52 Puebla	Mexico	20	51	46	36
53 Tijuana	Mexico	30	58	53	55
54 Guadaluajara	Mexico	30	24	80	36
55 Chiapas	Mexico	10	53	31	97
56 British Columbia	Canada	123	85	82	97
57 Ontario	Canada	21	12	56	61

STATS

Web design by [Free Website Templates](#)

# Buddies - map example



MAIN PAGE | TREE | SOCIAL (DOT) | SOCIAL (NEATO) |

### MAP

### NEWS AND EVENTS

Win a free backpacking trip to Egypt this summer

Read JJ's review of the China Temple Discovery Tour

Read the revised edition of Backpacki's guide to wild life in Africa

### STATS

Web design by Free Website Templates

# Hooking it up to your data...

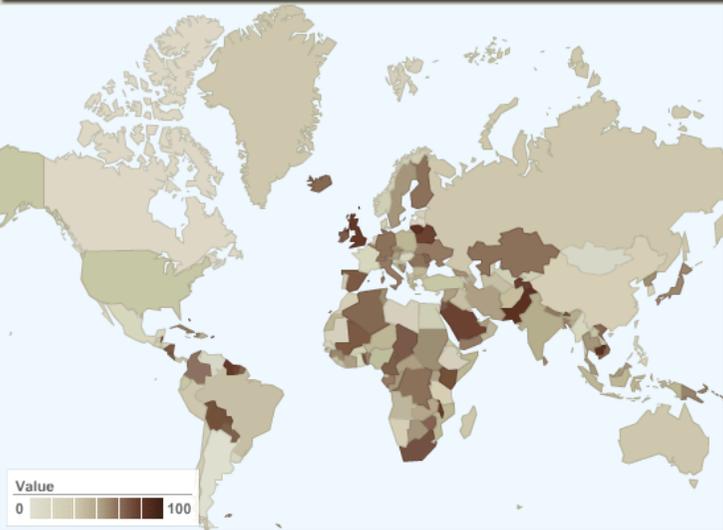
- Step 1: paste code snippet from chart [playground](#)
- Step 2: change your data source:

```
<html>
<head>
  <script type="text/javascript" src="http://www.google.com/jsapi"></script>
  <script type="text/javascript">
    google.load('visualization', '1', {packages: ['map']});
    google.setOnLoadCallback(drawVisualization);
    function drawVisualization() {
      var query = new google.visualization.Query(
        'http://spreadsheets.google.com/tq?key=AbCd&range=B1:D11');
      query.send(handleQueryResponse);
    }
    function handleQueryResponse(response) {
      var data = response.getDataTable();
      var container = document.getElementById('chart');
      chart = new google.visualization.Map(container);
      chart.draw(data, null);
    }
  </script>
</head>
<body> <div id="chart" style="height: 400px; width: 400px;"></div></body>
</html>
```

# Interactive Charts demo site

DESTINATIONS | GEO | GENDER | PRICE | AGE | BALL |  
SOCIAL | BUDDIES | FRIENDS ON MAP |

**MAP**



Value  
0 100

**NEWS AND EVENTS**

Finalists of the Backpacki Photo of the Week **BPOW** competition:



"Steps" by tentenant81@backpaki.com



"Woods" by Lesley from NSW Australia



"Lights" by johnjourney@backpaki.com

**STATS**



Web design by [Free Website Templates](#)

# PART 3: “UNDER THE HOOD”

# Interactive Charts demo site

MAIN PAGE | PRICE | GENDER | AGE | SOCIAL | TABLE | FRIENDS ON MAP |

**MAP**

CA  
Value: 92

Value  
10 100

**NEWS AND EVENTS**

Win a free backpacking trip to Egypt this summer

Read JJ's review of the China Temple Discovery Tour

Read the revised edition of Backpacki's guide to wild life in Africa

**STATS**

Web design by [Free Website Templates](#)

MAIN PAGE | PRICE | GENDER | AGE | SOCIAL | TABLE | FRIENDS ON MAP |

**MAP**

Zoom Out

British Columbia  
Value: 5

Value  
2 5

**NEWS AND EVENTS**

Win a free backpacking trip to Egypt this summer

Read JJ's review of the China Temple Discovery Tour

Read the revised edition of Backpacki's guide to wild life in Africa

**STATS**

Zoom: 1d 5d 1m 3m 6m 1y Max ● reviews 17 | February 03, 2009

20  
10  
0

00 2002 2004 2006 2008

2000 2002 2004 2006 2008

C. Mexican Party #3  
2009-2-3  
B. Mexican Party #2  
A. Mexican Party #1  
2000-1-1

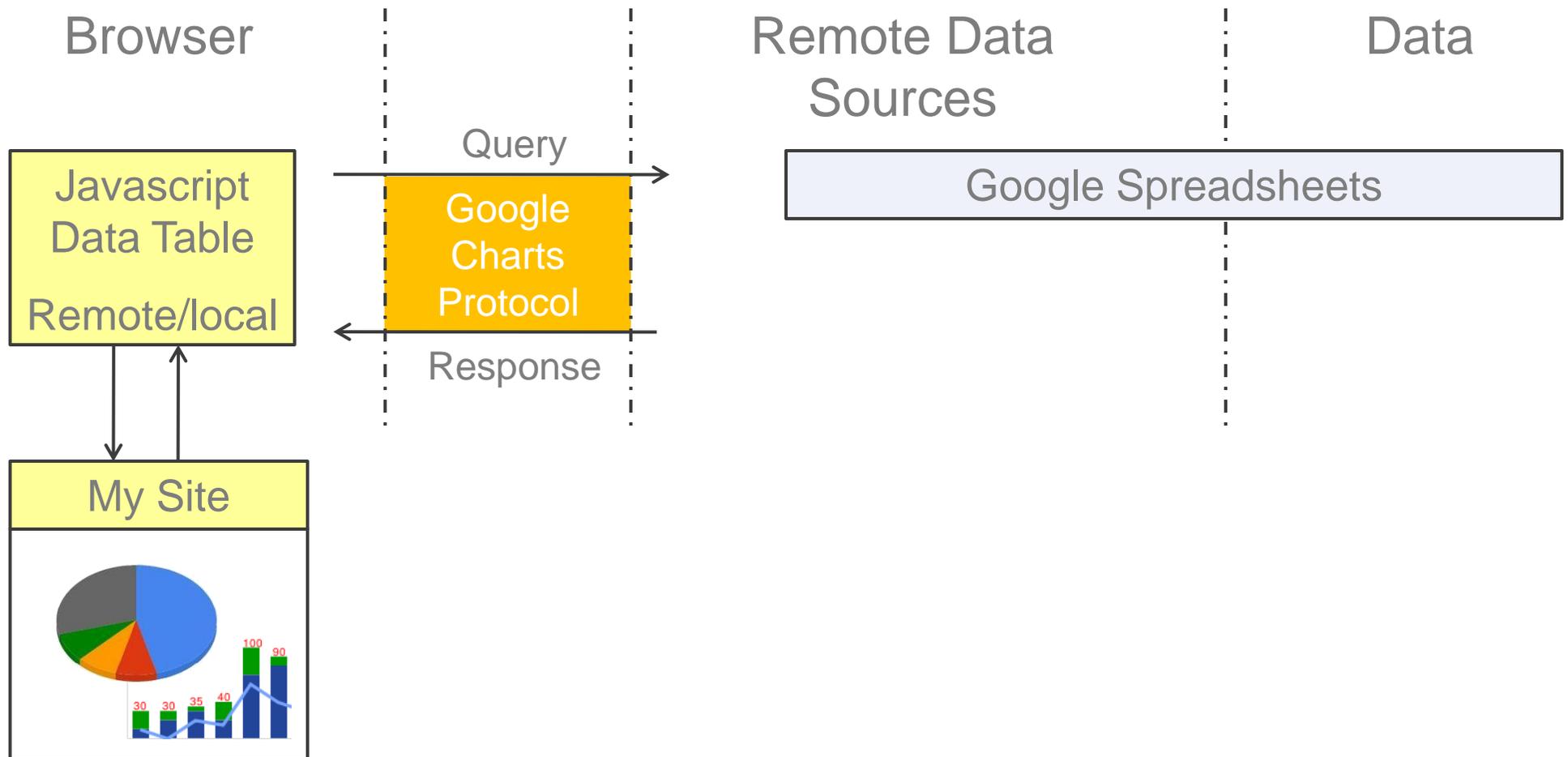
Web design by [Free Website Templates](#)

# Events example – zoom in GeoMap

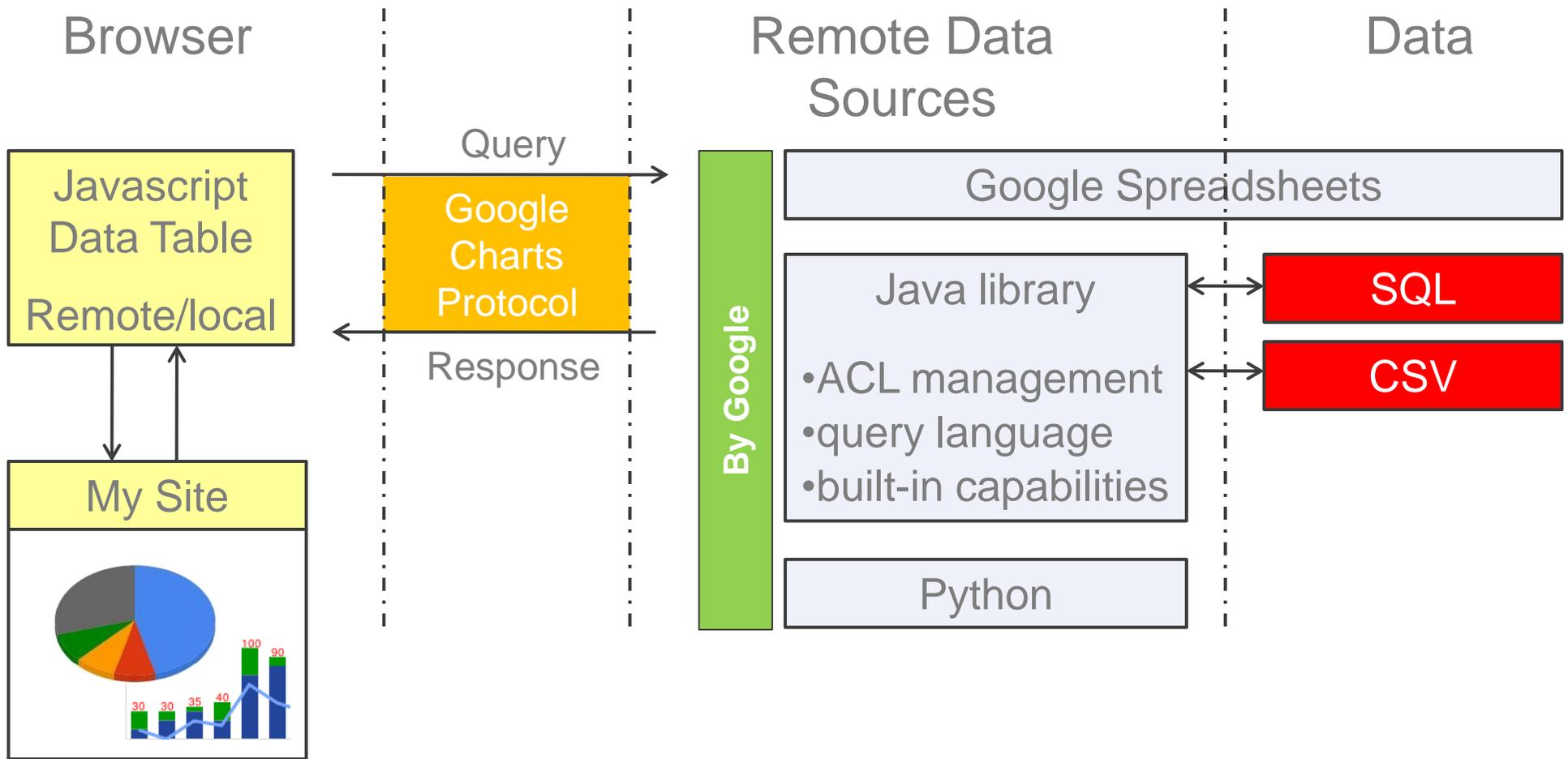
```
function snippet () {  
  this.geomap = new google.visualization.GeoMap(  
    document.getElementById('mapdiv'));  
  google.visualization.events.addListener(this.geomap, 'regionClick',  
    goog.bind(function(e) {  
      this.stack.push(e.region);  
      this.draw();  
    }, this));  
  google.visualization.events.addListener(this.geomap, 'zoomOut',  
    goog.bind(function(e) {  
      this.stack.pop();  
      this.draw();  
    }, this));  
}
```



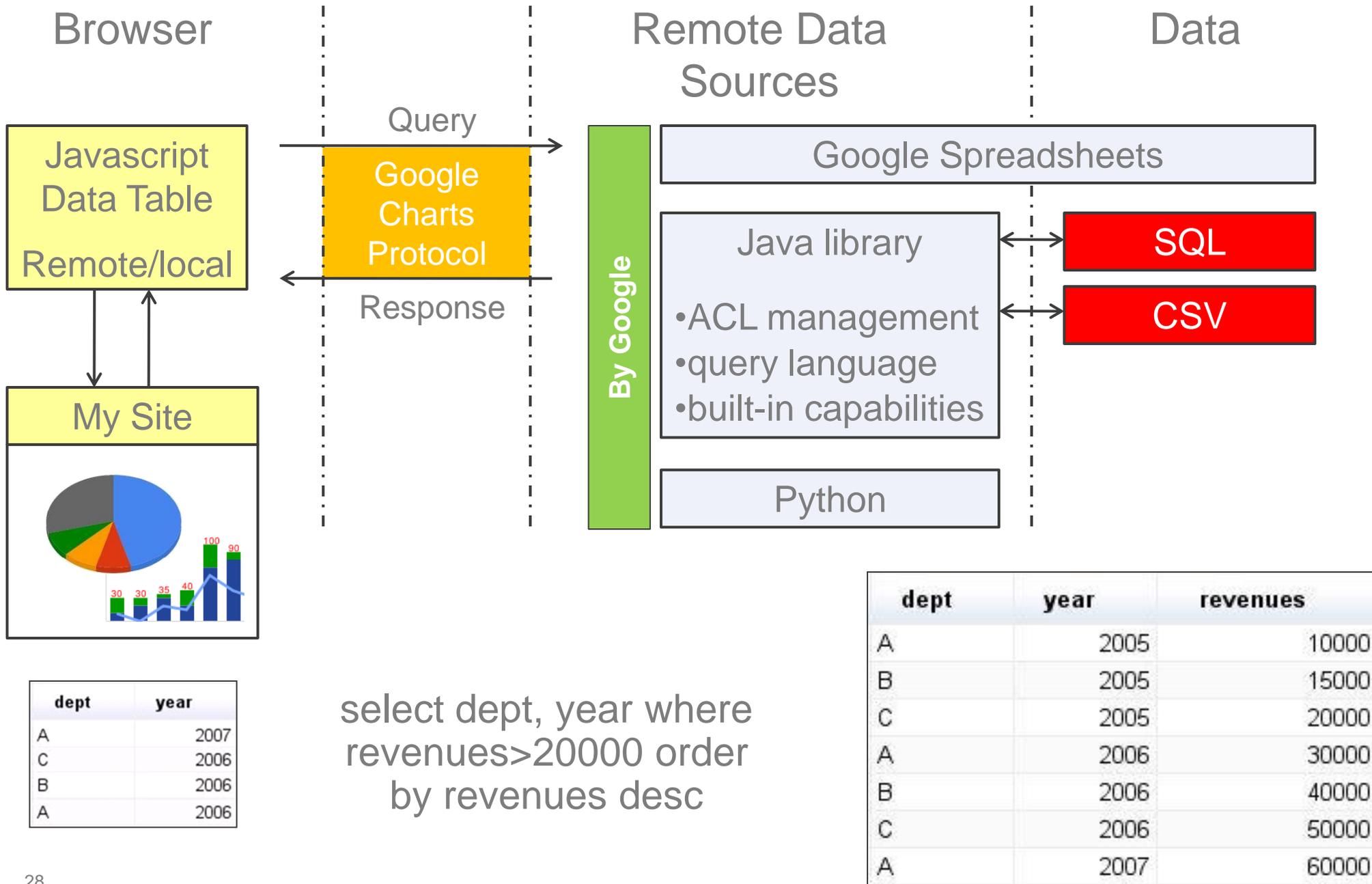
# Implementing your own data source



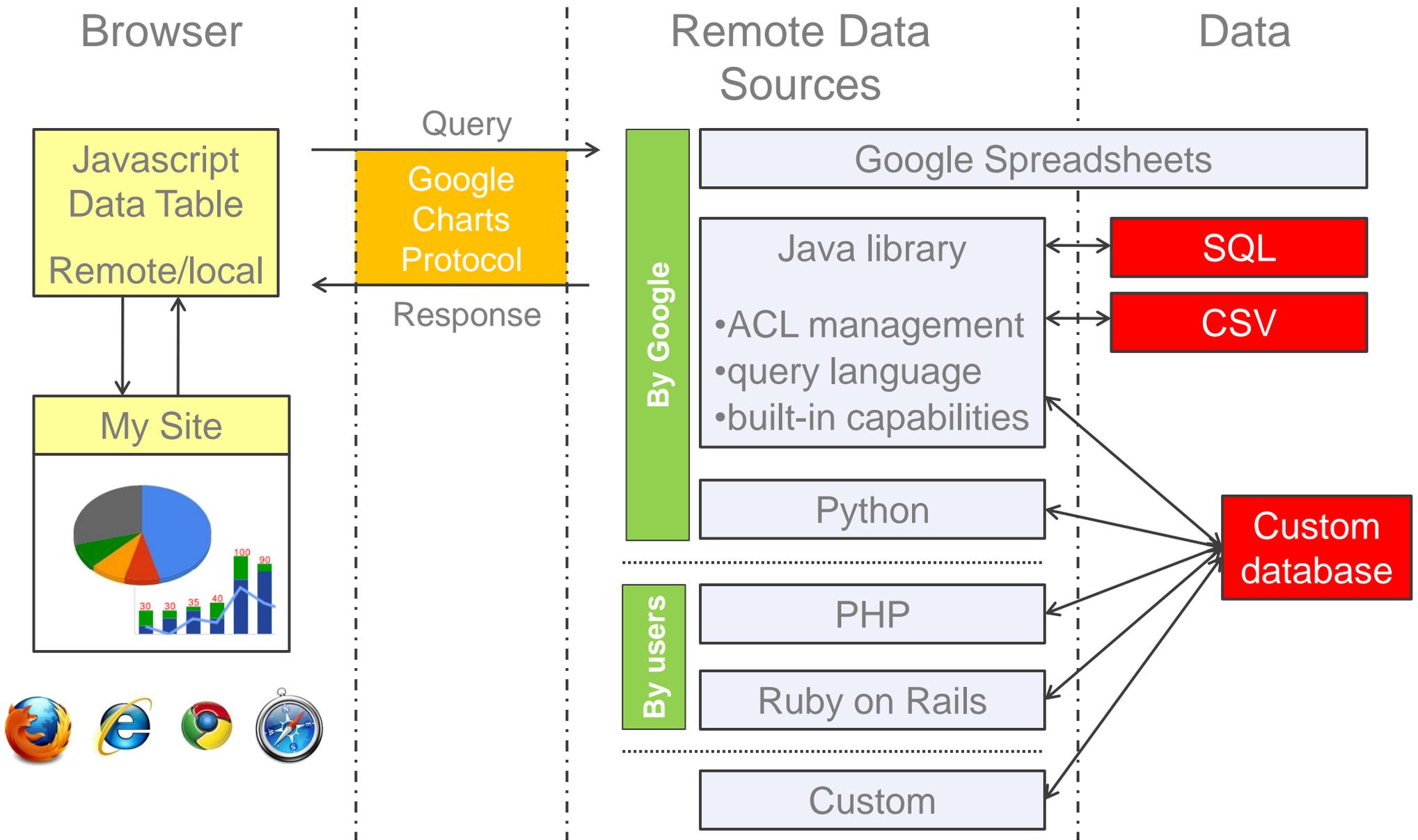
# Implementing your own data source



# Implementing your own data source



# Implementing your own data source



# Hooking up your visualization...

```
gviz_word_cumulus.WordCumulus.prototype.draw = function(data, options) {  
  var attributes = { ... };  
  var flashvars = { ... };  
  var tags_xml = "<tags>";  
  for (var row = 0; row < data.getNumberOfRows(); row++) {  
    var label = data.getFormattedValue(row, 0);  
    var uri = data.getFormattedValue(row, 1);  
    var font_size = data.getFormattedValue(row, 2);  
    var tag = "<a href='" + uri + "' target='_blank'  
              style='font-size:" + String(font_size) + "pt;'>" +  
              label + "</a>";  
    tags_xml = tags_xml + tag;  
  }  
  tags_xml = tags_xml + "</tags>";  
  flashvars["tagcloud"] = tags_xml;  
  swfobject.embedSWF(  
    "http://word-cumulus-goog-vis.googlecode.com/svn/trunk/tagcloud.swf",  
    this.container_id, options.width, options.height, '10', "", flashvars, attributes);  
};
```

Convert the data  
table to XML

Embedding  
the SWF

# Interactive Charts demo site

MAIN PAGE | PRICE | GENDER | AGE | SOCIAL | TABLE | FRIENDS ON MAP |

MAP



France  
Brazil  
England  
Argentina  
Italy  
Germany

NEWS AND EVENTS

Win a free backpacking trip to Egypt this summer



Read JJ's review of the China Temple Discovery Tour



Read the revised edition of Backpacki's guide to wild life in Africa



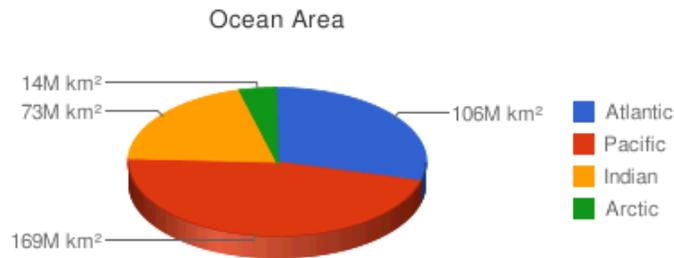
STATS



Web design by [Free Website Templates](#)

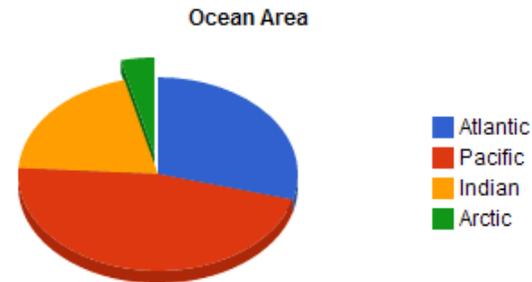
# **PART 4: SERVER SIDE RENDERING & CLIENT SIDE INTERACTIVITY**

# Side by side comparison



## Image charts

- Static image
- URL access
- <1s

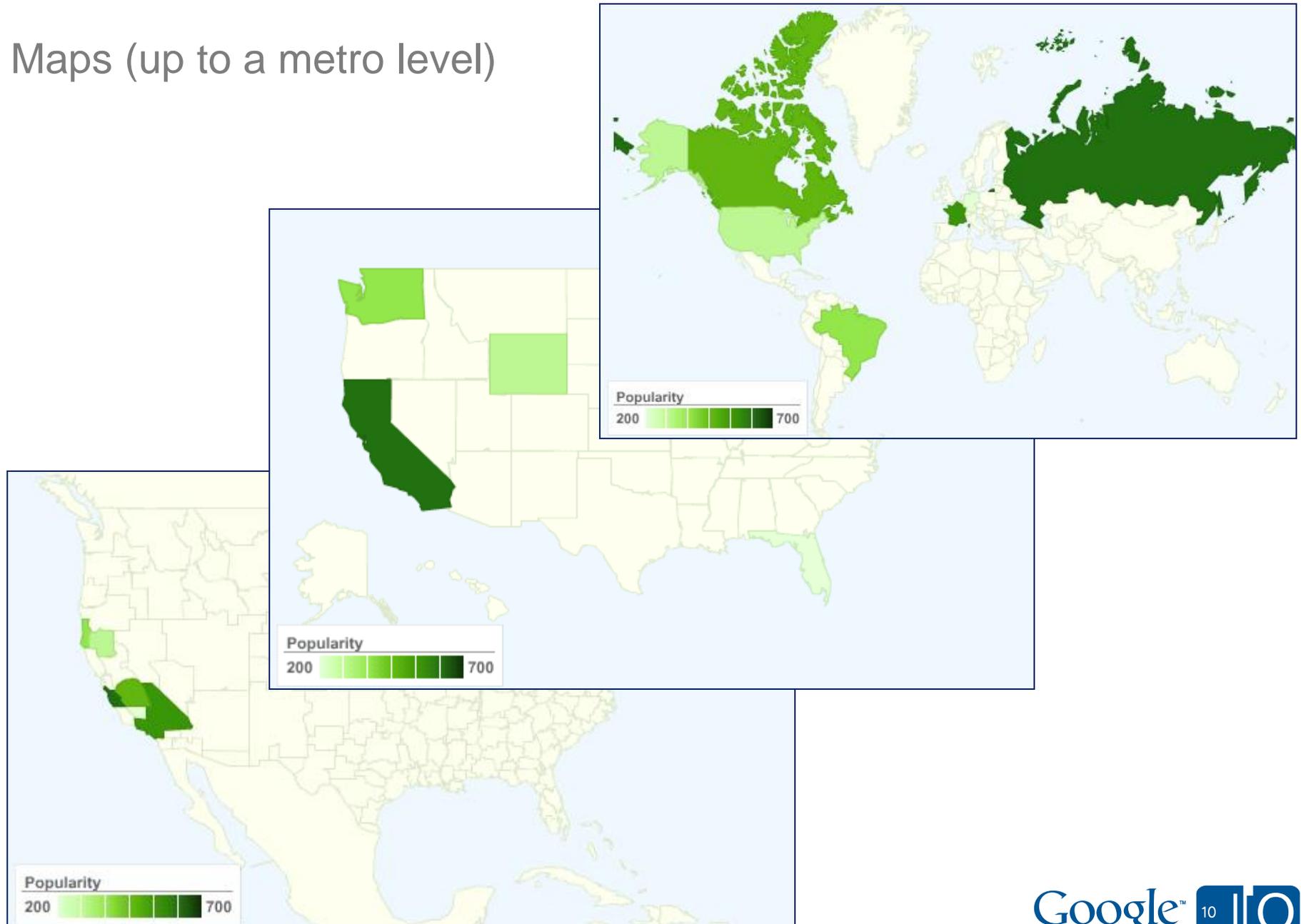


## Interactive charts

- Interactive experience
- Data remains on client
- Basic JavaScript
- Data manipulation functions: sort, group,...

# Server side rendering and client side interactivity

## 1. Maps (up to a metro level)



# Server side rendering and client side interactivity

1. Maps (up to a metro level)
2. Interactive GraphViz

The screenshot displays a web application interface with a dark brown header and footer. The header contains navigation links: DESTINATIONS | GEO | GENDER | PRICE | BALL | SOCIAL | BUDDIES | FRIENDS ON MAP |. The main content area is divided into three sections:

- MAP:** A social network graph with 15 nodes (names) connected by lines. The nodes are: Al (green), Kim (green), Lee (orange), Dan (blue), Mik (teal), Me (purple), Gil (pink), Niv (purple), Les (purple), Bo (red), Pam (cyan), Nel (light green), Stu (orange), and Tom (blue).
- NEWS AND EVENTS:** A section with a title "NEWS AND EVENTS" and two photo thumbnails. The first photo is titled "Steps" by tentenant81@backpaki.com, showing footprints on a sandy beach. The second photo is titled "Woods" by Lesley from NSW Australia, showing a blue bird in a wooded area.
- STATS:** A section with a large photo of a man sticking his tongue out.

The footer contains the text: Web design by Free Website Templates.

# Google Chart Tools



charts

1. Rich gallery
2. Free of charge
3. Highly customizable
4. Interactive playground
5. Active developer group
6. Live data from many sources
7. Easy to adopt and simple to use
8. Detailed documentation and examples



# Questions?

<http://bit.ly/99tmxi>

