

From a single chart to elaborate data driven storytelling, Google Chart Tools now provides a crisp and accessible experience based on our new HTML5 gallery. Come and learn how you can use animations, annotations and other visual semantics and to take user-interaction with rich data, to the next level

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About Michael Fink

[View full profile](#)

Michael Fink joined Google Research at 2005. Since then Michael initiated several media based projects including YouTube's Interactive Video Annotations, which enables embedding hyperlinks onto objects in YouTube videos. In the last three years, Michael is leading the Google Trends and Chart Tools teams. In his 20% time Michael originated the new Center for Design, Media and Technology in the Jerusalem Leper Colony.

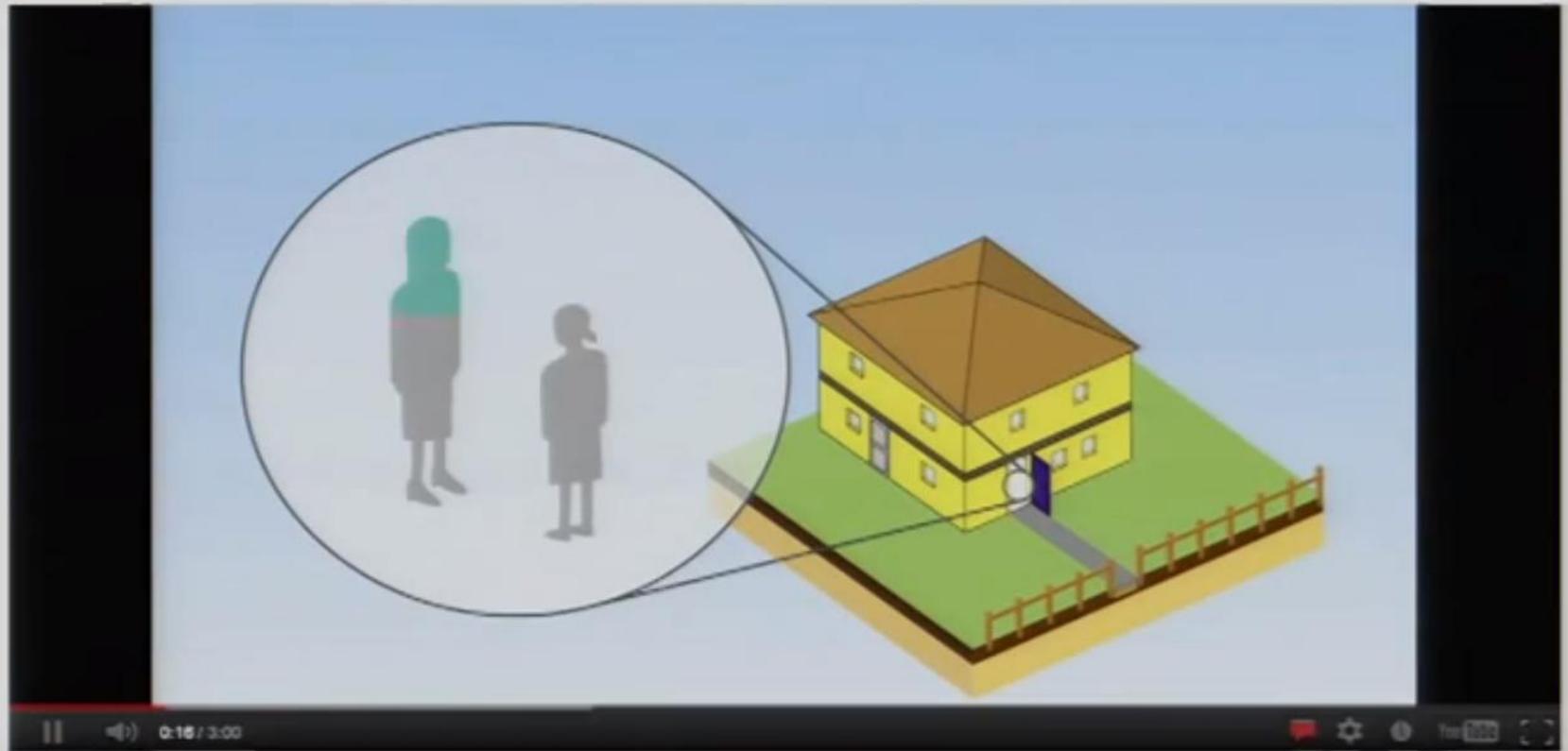


About Yinnon Haviv

[View full profile](#)

Yinnon is a Software Engineer for Google Chart Tools, providing an extensive, consistent and beautiful set of interactive visualizations, accessed through a clean API. Before joining Google, Yinnon developed various static analysis algorithms for identifying web application security flows and for identifying the impact of configuration changes in SAP applications.

# Data driven storytelling... our inspiration



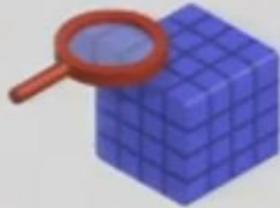
source: Tomas Nilsson



# Data Driven Storytelling

Yinnon Haviv - Software Engineer, Google  
Michael Fink - Product Manager, Google

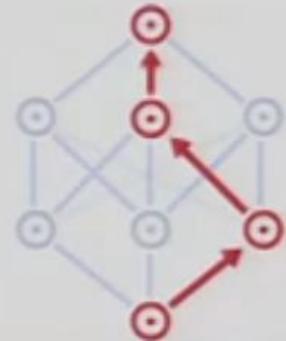
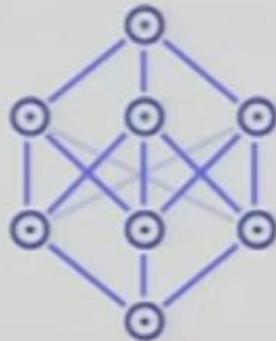
# Outline



*Data Exploration*



*Storytelling*





# Data Exploration

Hand over the control to your users

# Our data cube: Performer's search trends

Time	Country	Performer	Popularity
Dec 08	United States	Beyonce	17.11
Dec 08	United States	Madonna	5.74
Dec 08	United Kingdom	Beyonce	16.64
Dec 08	United Kingdom	Madonna	7.23
Jan 09	United States	Beyonce	15.60
Jan 09	United States	Madonna	5.02
Jan 09	United Kingdom	Beyonce	11.95
Jan 09	United Kingdom	Madonna	5.70

# Using controls to explore your data



# Dashboards

are easy

JAVASCRIPT

```
var dashboard = new google.visualization.Dashboard(dashboardDiv);
var timePickerControl = new google.visualization.ControlWrapper({
  'controlType': 'ChartRangeFilter', ... });
var countryPickerControl = new google.visualization.ControlWrapper({
  'controlType': 'CategoryFilter', ... });
var performerPicker = new google.visualization.ControlWrapper({
  'controlType': 'CategoryFilter', ... });
var tableChart = new google.visualization.ChartWrapper({
  'chartType': 'Table', ... });

dashboard.bind([ timePickerControl ], [ countryPickerControl ]);
dashboard.bind([ countryPickerControl ], [ performerPicker ]);
dashboard.bind([ performerPicker ], [ tableChart ]);

dashboard.draw(data);
```

# Dashboards

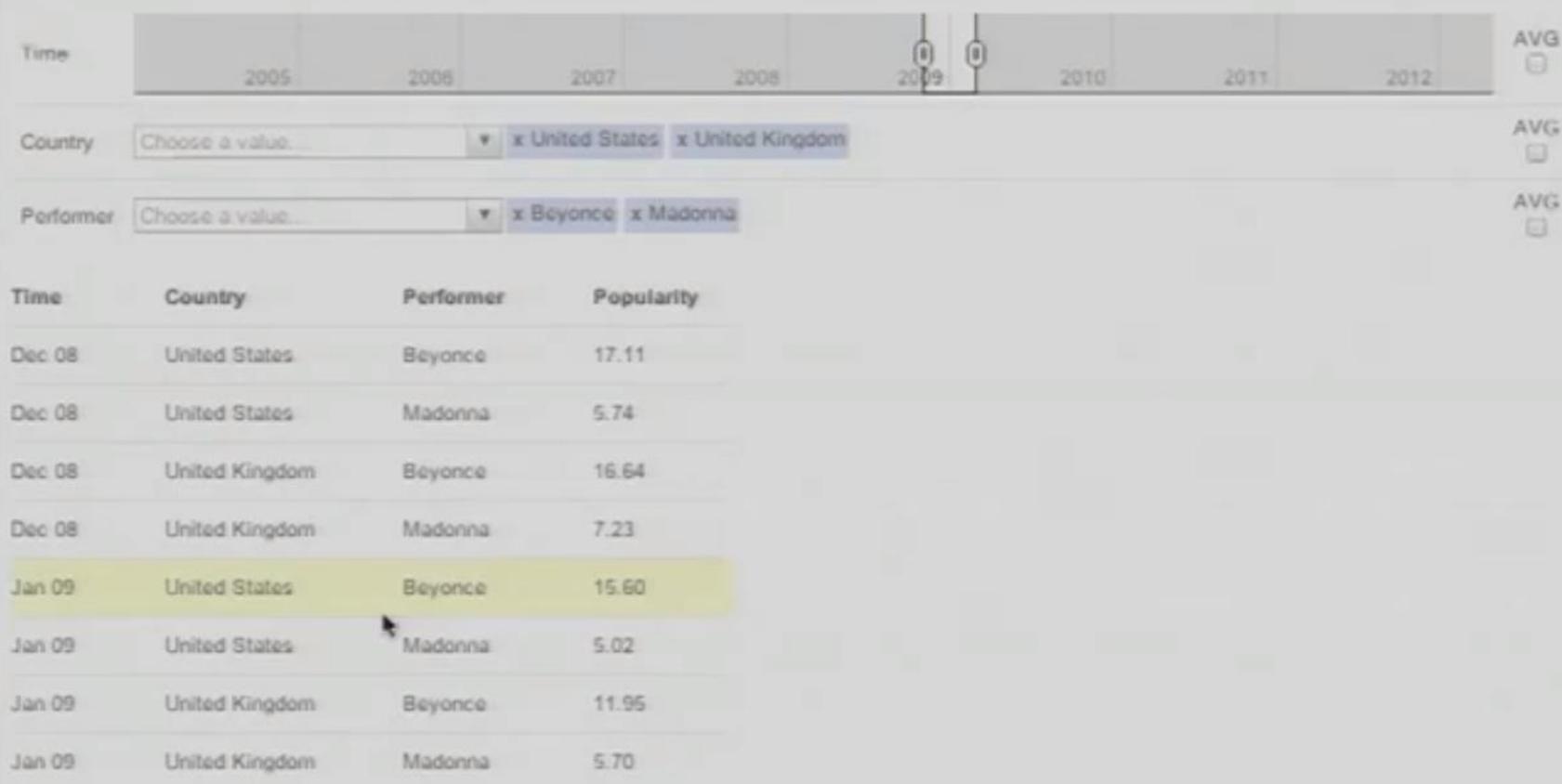
are flexible

JAVASCRIPT

```
var timePickerControl = new google.visualization.ControlWrapper({
  'controlType': 'ChartRangeFilter',
  'containerId': 'timePicker',
  'options': {
    'filterColumnIndex': 0,
    'ui': { ... },
    'minRangeSize': 27*24*60*60*1000, // 27 days
  },
  'state': {
    'range': { 'start': new Date(2008, 10, 2), 'end': new Date(2009, 2, 1) }
  }
});
```

More on dashboards: [Chart Tools GoogleIO 2011](#)

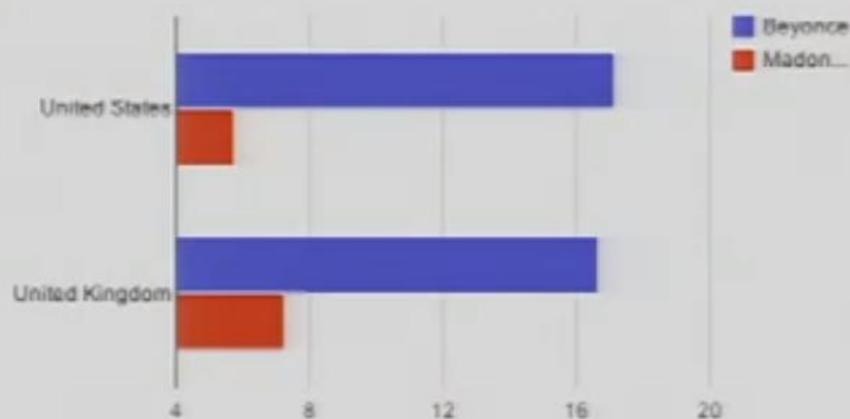
# Visualizing your data slice



# Visualizing your data slice



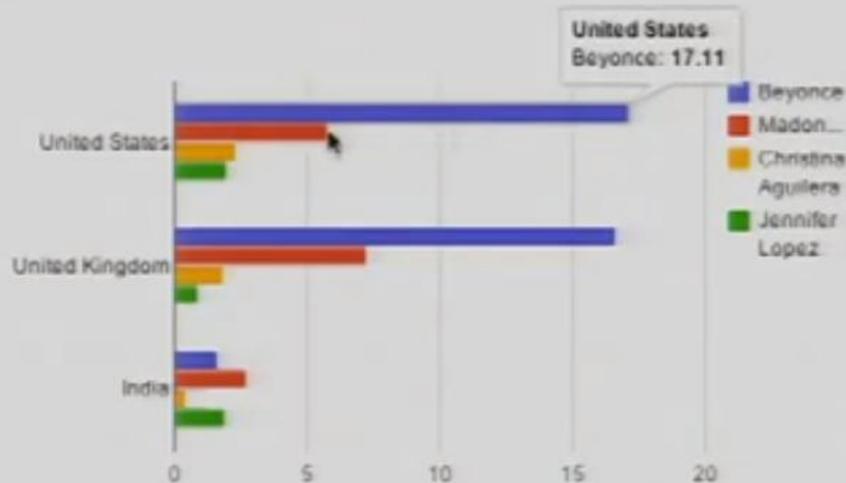
Time	Country	Performer	Popularity
Dec 08	United States	Beyonce	17.11
Dec 08	United States	Madonna	5.74
Dec 08	United Kingdom	Beyonce	16.64
Dec 08	United Kingdom	Madonna	7.23



# Visualizing your data slice



Time	Country	Performer	Popularity
Dec 08	United States	Beyonce	17.11
Dec 08	United States	Madonna	5.74
Dec 08	United States	Christina Aguilera	2.33
Dec 08	United States	Jennifer Lopez	1.96
Dec 08	United Kingdom	Beyonce	16.64
Dec 08	United Kingdom	Madonna	7.23
Dec 08	United Kingdom	Christina Aguilera	1.83
Dec 08	United Kingdom	Jennifer Lopez	0.88



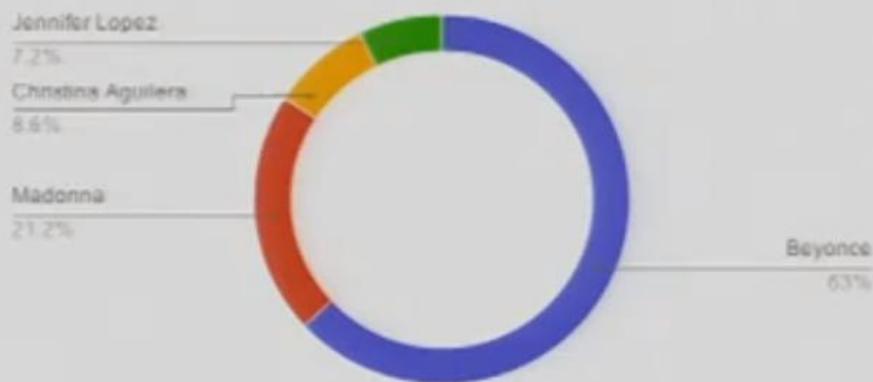
# Visualizing your data slice

Time: 2005 2006 2007 2008 2009 2010 2011 2012 AVG

Country: Choose a value... x United States AVG

Performer: Choose a value... x Beyoncé x Madonna x Christina Aguilera x Jennifer Lopez AVG

Time	Country	Performer	Popularity
Dec 08	United States	Beyonce	17.11
Dec 08	United States	Madonna	5.74
Dec 08	United States	Christina Aguilera	2.33
Dec 08	United States	Jennifer Lopez	1.96



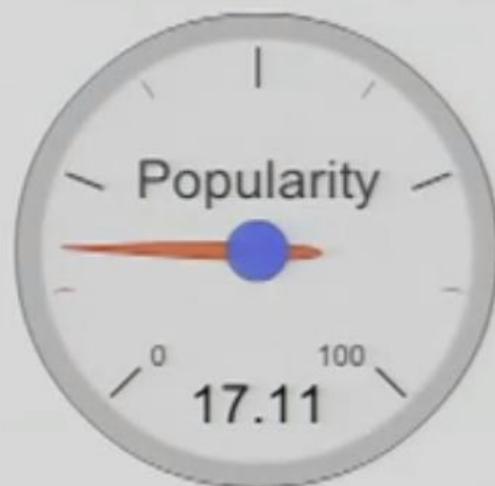
# Visualizing your data slice

Time  2005  2006  2007  2008  2009  2010  2011  2012 AVG

Country   United States AVG

Performer   Beyonce AVG

Time	Country	Performer	Popularity
Dec 08	United States	Beyonce	17.11



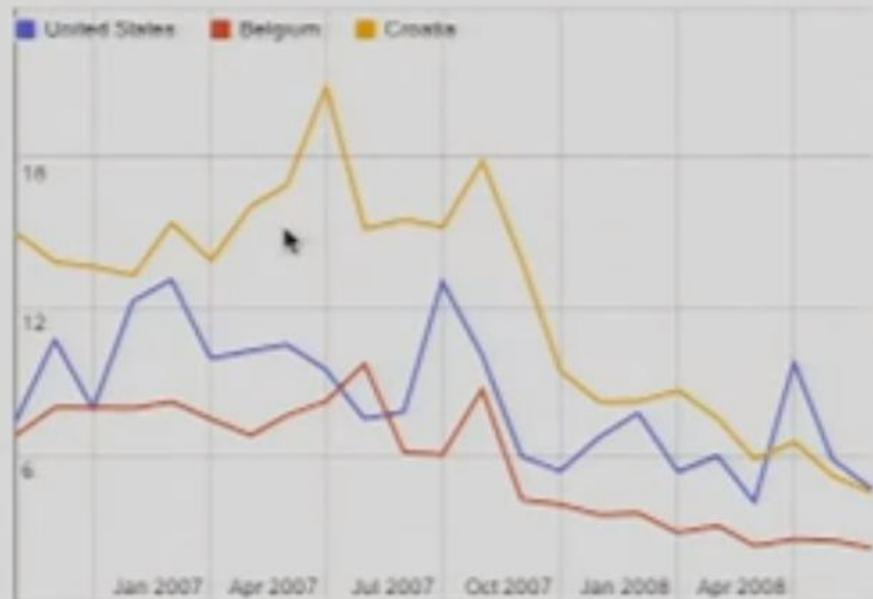
# Visualizing your data slice

Time: 2005 2006 2007 2008 2009 2010 2011 2012 AVG

Country:  x United States x Belgium x Croatia AVG

Performer:  x Beyonce AVG

Time	Country	Performer	Popularity
Aug 06	United States	Beyonce	7.32
Aug 06	Belgium	Beyonce	6.79
Aug 06	Croatia	Beyonce	14.95
Sep 06	United States	Beyonce	10.66
Sep 06	Belgium	Beyonce	7.92
Sep 06	Croatia	Beyonce	13.76
Oct 06	United States	Beyonce	7.87
Oct 06	Belgium	Beyonce	7.92



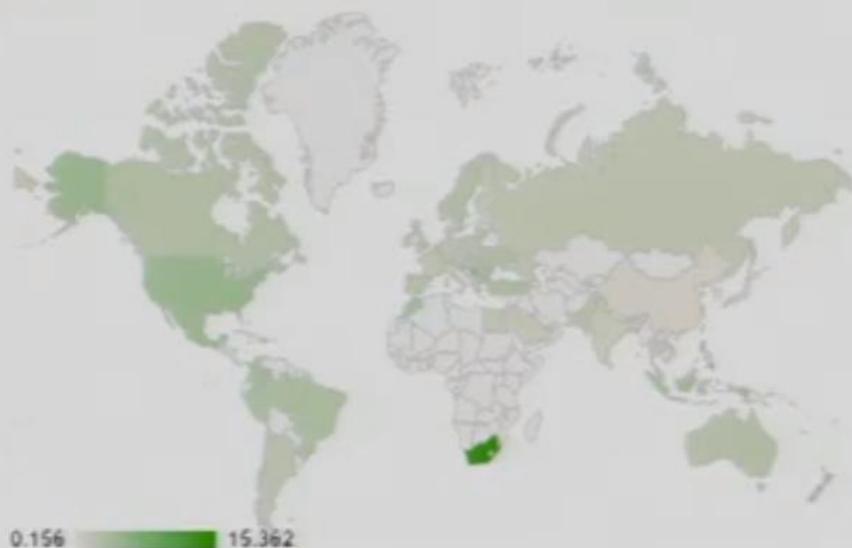
# Visualizing your data slice

Time  2005  2006  2007  2008  2009  2010  2011  2012  AVG

Country   AVG

Performer  x Beyonce  AVG

Time	Country	Performer	Popul.
Jun 08	World	Beyonce	2.96
Jun 08	United States	Beyonce	4.62
Jun 08	United Kingdom	Beyonce	2.97
Jun 08	Germany	Beyonce	1.64
Jun 08	France	Beyonce	1.76
Jun 08	Brazil	Beyonce	3.24
Jun 08	Japan	Beyonce	0.50
Jun 08	Spain	Beyonce	2.48
Jun 08	Canada	Beyonce	2.00





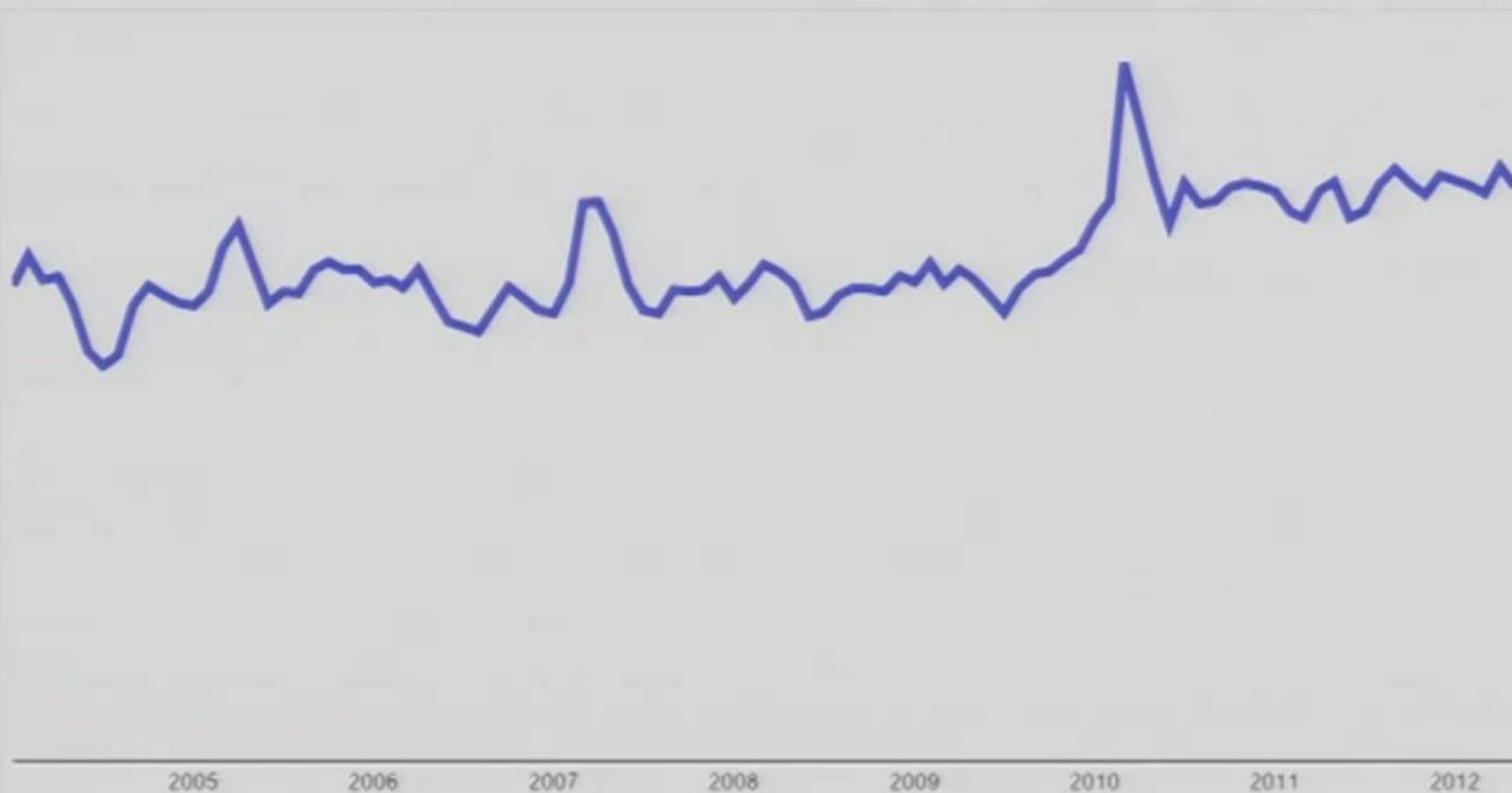
# Data Driven Storytelling

Walk your users through a curated path

# Narrative 101

- Act 1
  - Protagonist and antagonist
  - Time and space
  - Conflict
- Act 2
  - Attempts to resolve the conflict
  - Secondary conflicts emerge
- Act 3
  - Climax
  - Comedy vs. tragedy

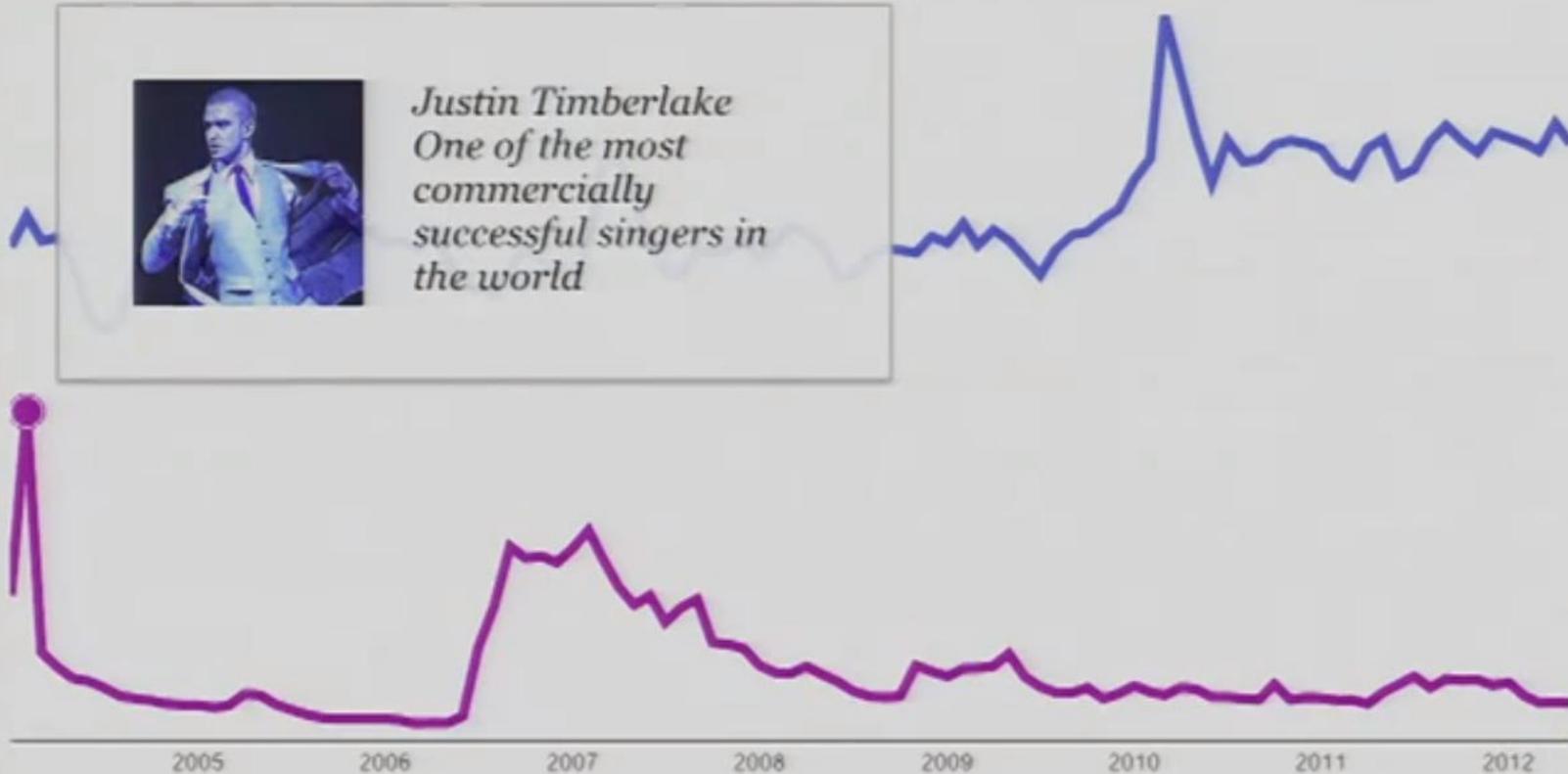
## Reaching for the stars



# Reaching for the stars



*Justin Timberlake  
One of the most  
commercially  
successful singers in  
the world*

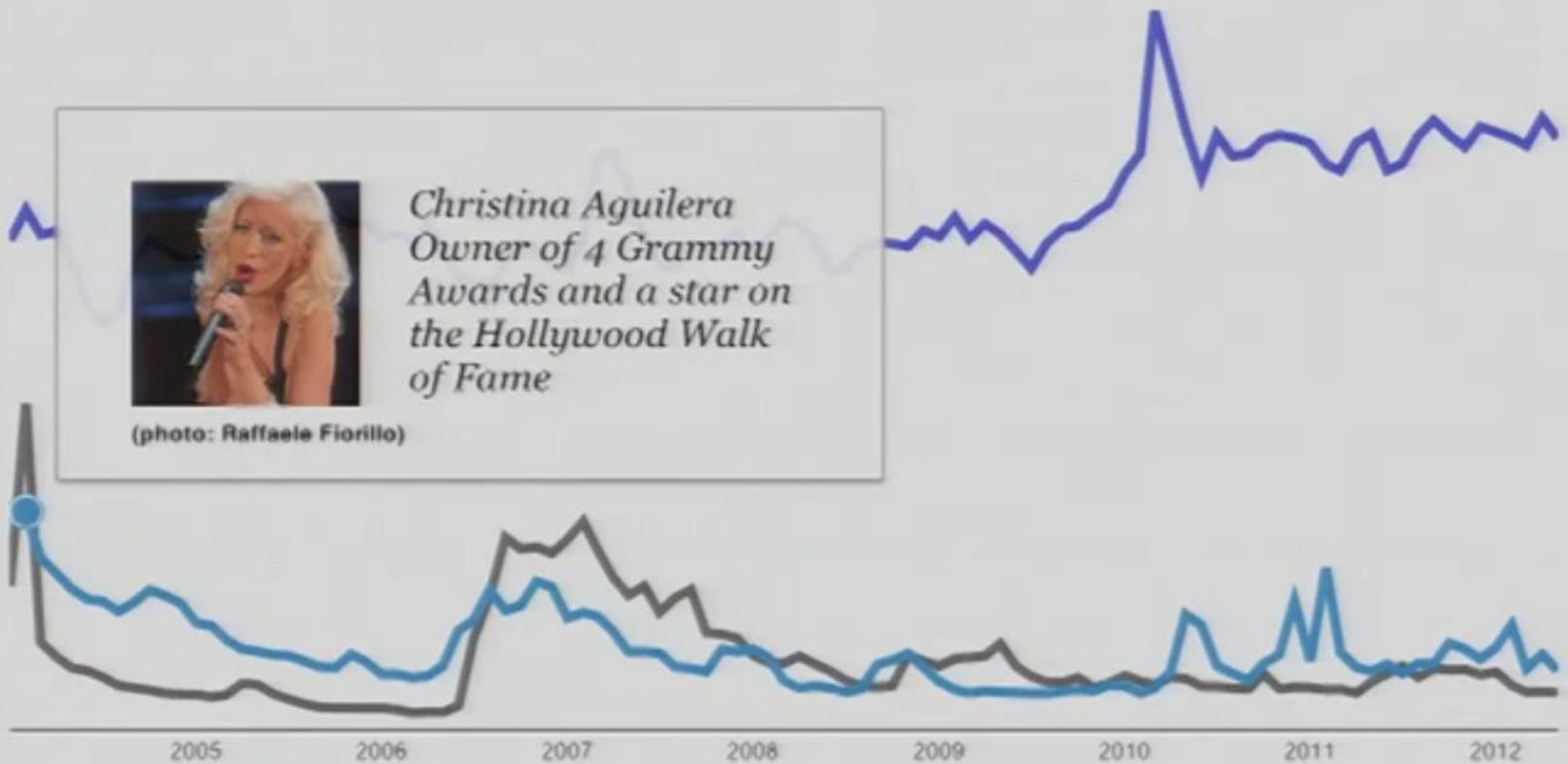


# Reaching for the stars



*Christina Aguilera  
Owner of 4 Grammy  
Awards and a star on  
the Hollywood Walk  
of Fame*

(photo: Raffaele Fiorillo)

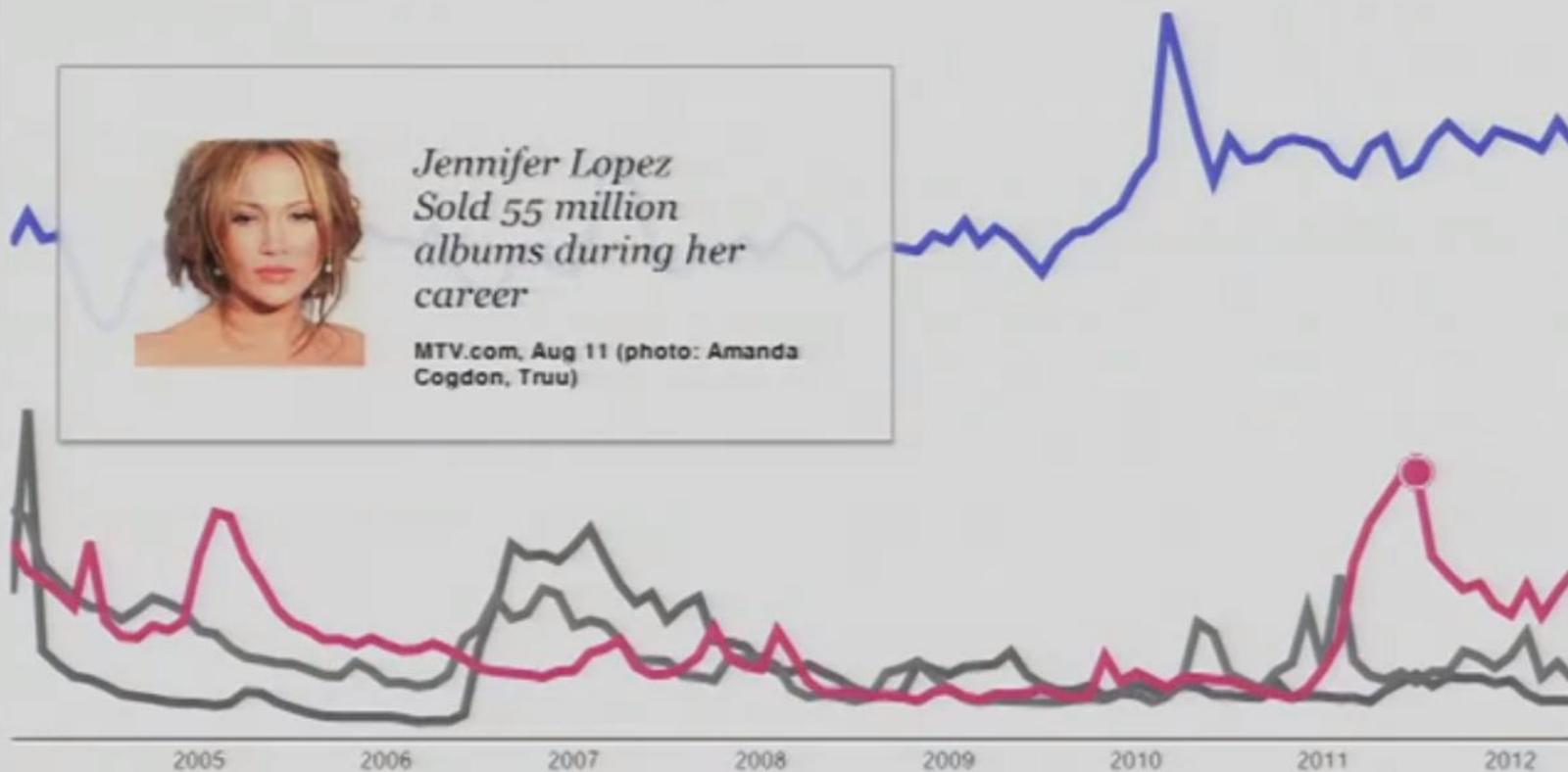


# Reaching for the stars



*Jennifer Lopez  
Sold 55 million  
albums during her  
career*

MTV.com, Aug 11 (photo: Amanda  
Cogdon, Truu)



# Reaching for the stars



*The world's top-selling female recording artist of all time*

Guinness World Records (photo: Olavtenbroek)

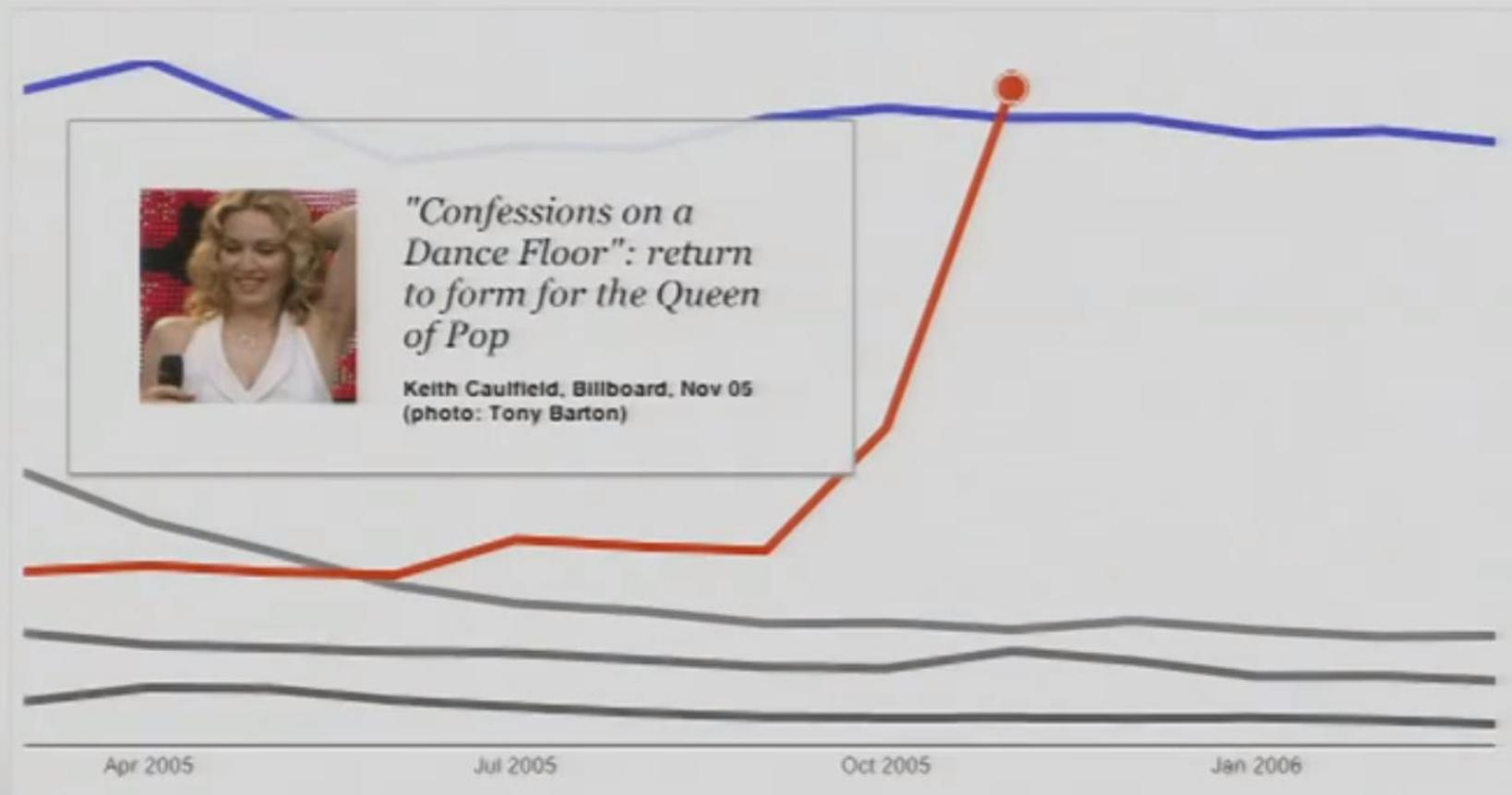
Apr 2004

Jul 2004

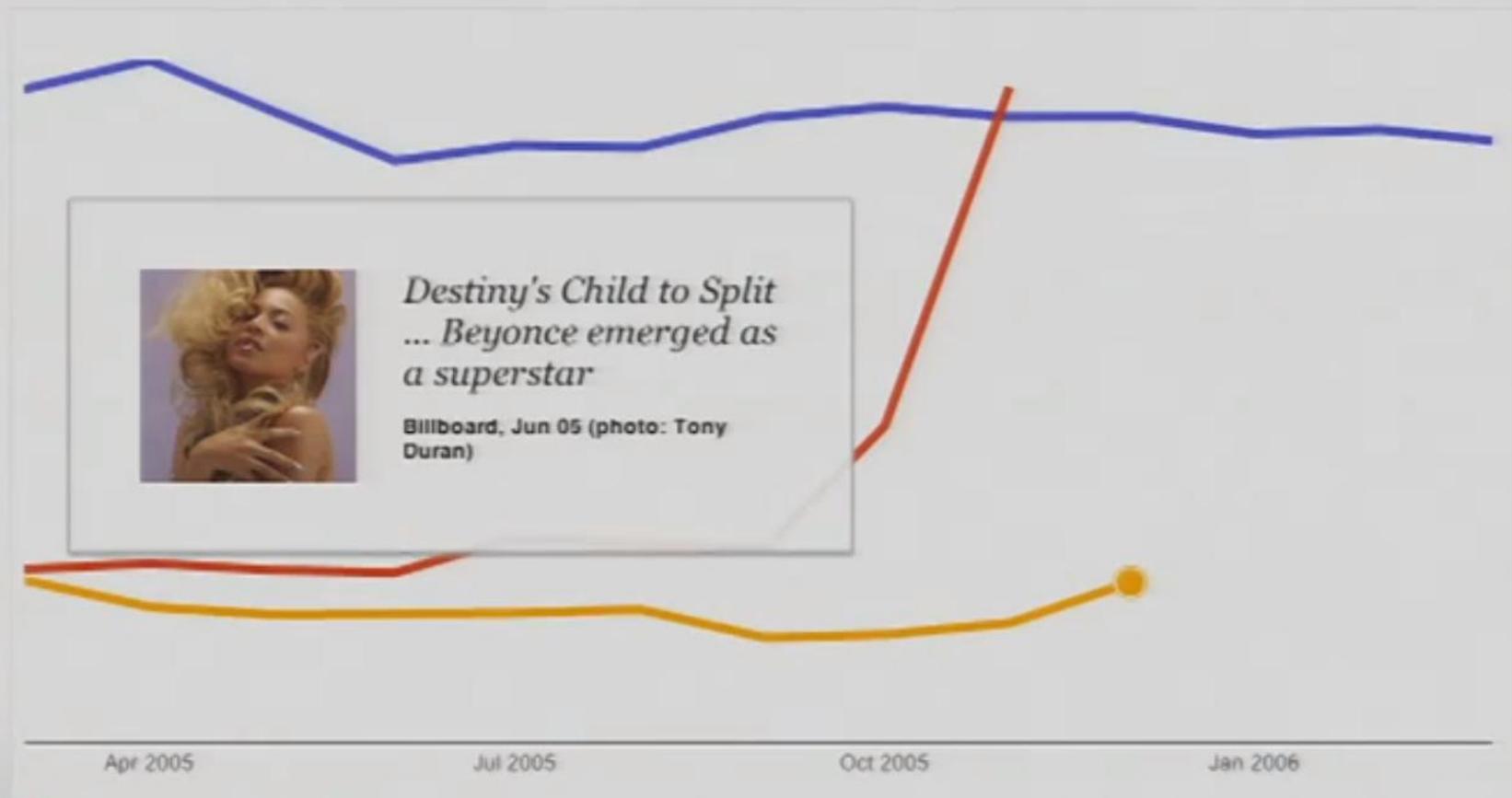
Oct 2004



# Reaching for the stars



# Reaching for the stars



# Reaching for the stars



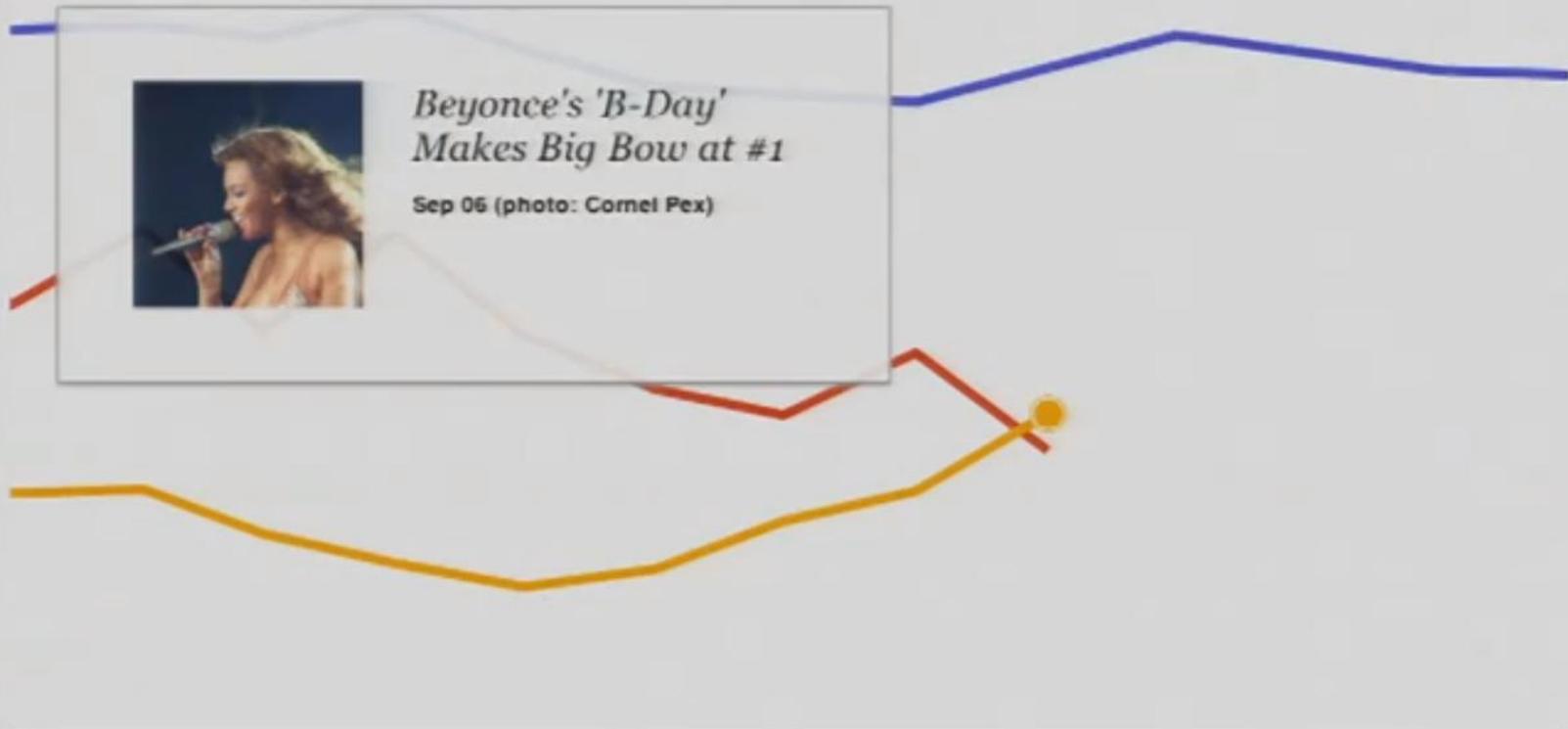
*Beyoncé's 'B-Day'  
Makes Big Bow at #1*

Sep 06 (photo: Cornel Pex)

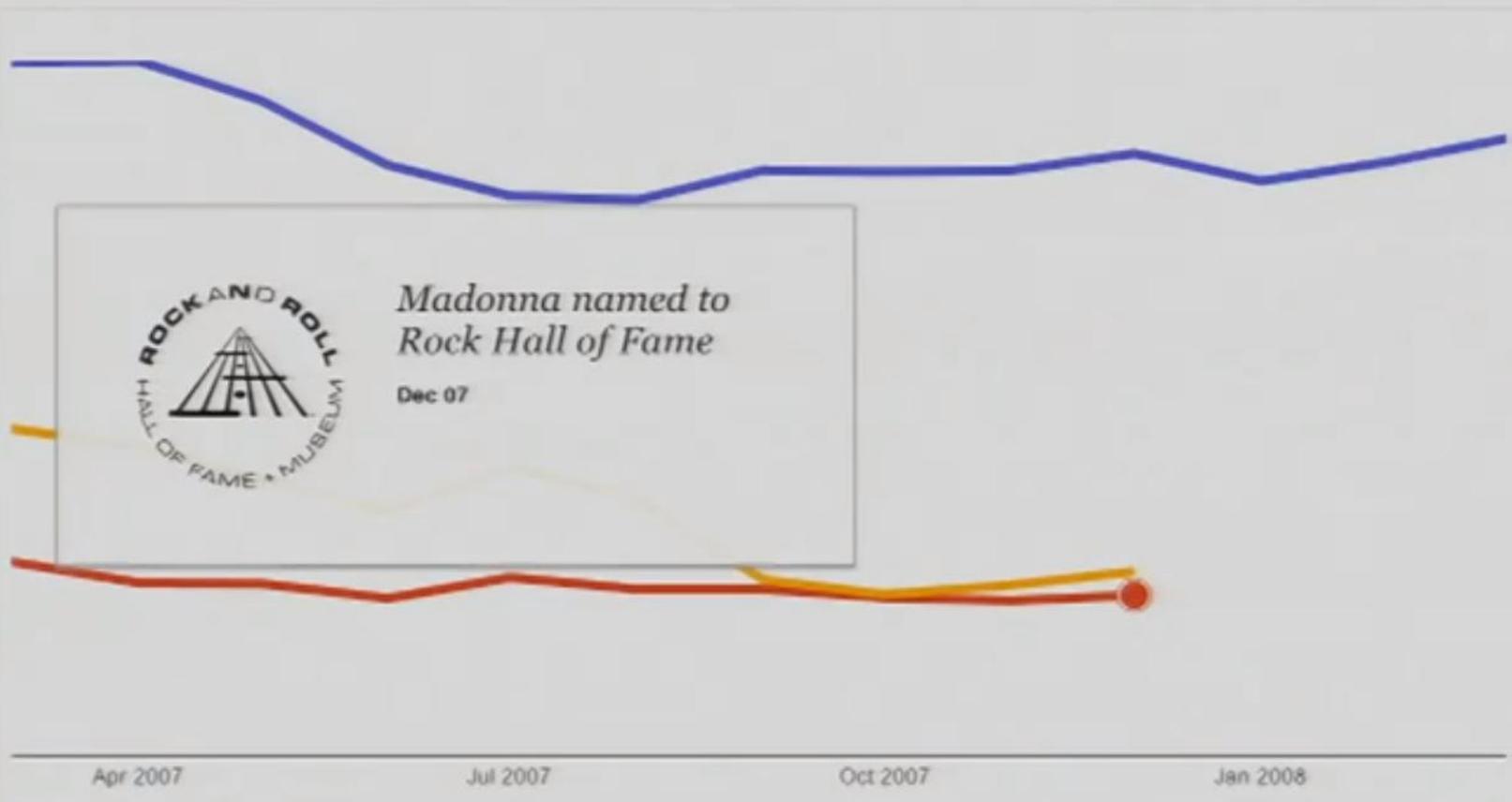
Apr 2006

Jul 2006

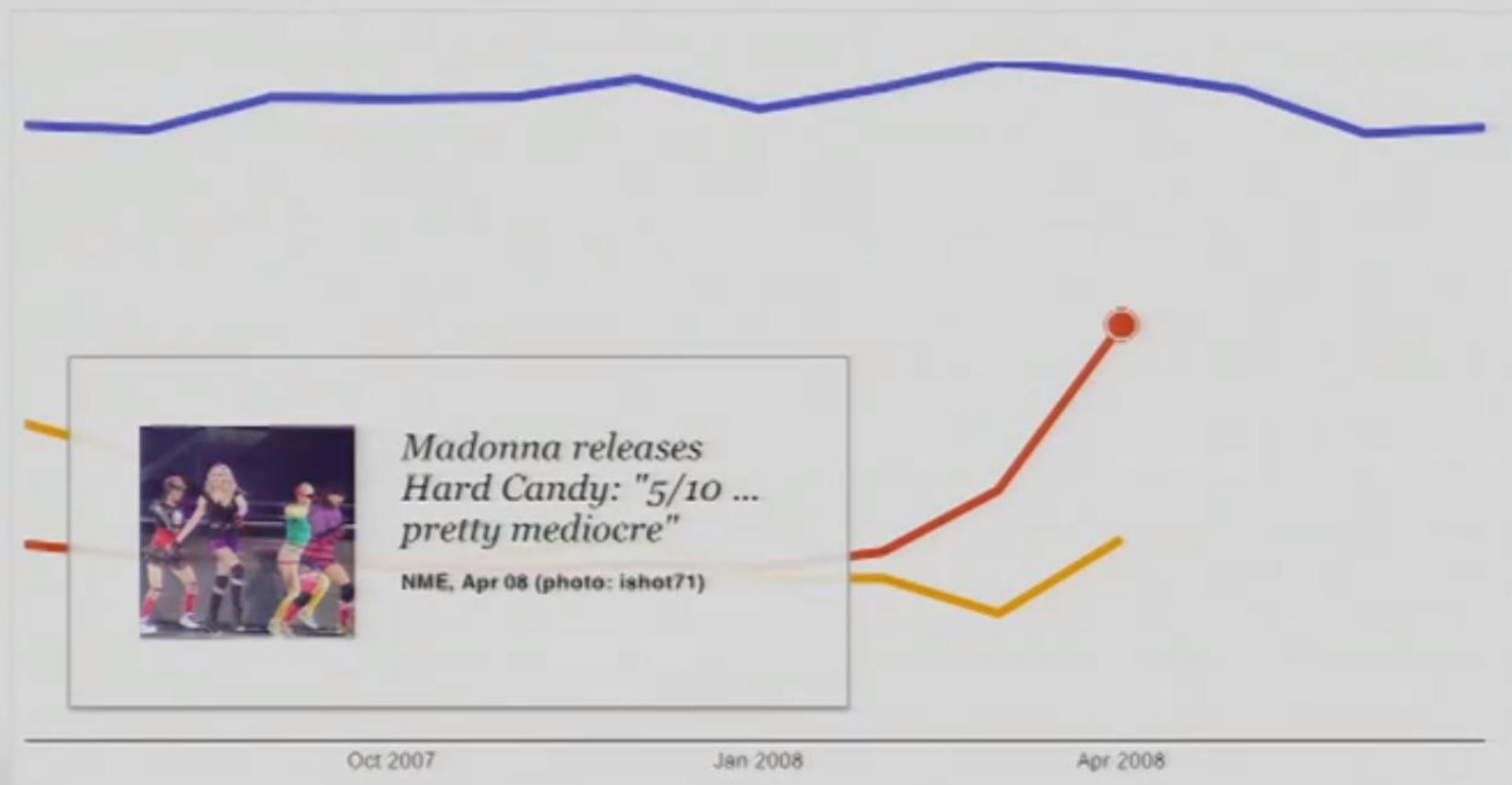
Oct 2006



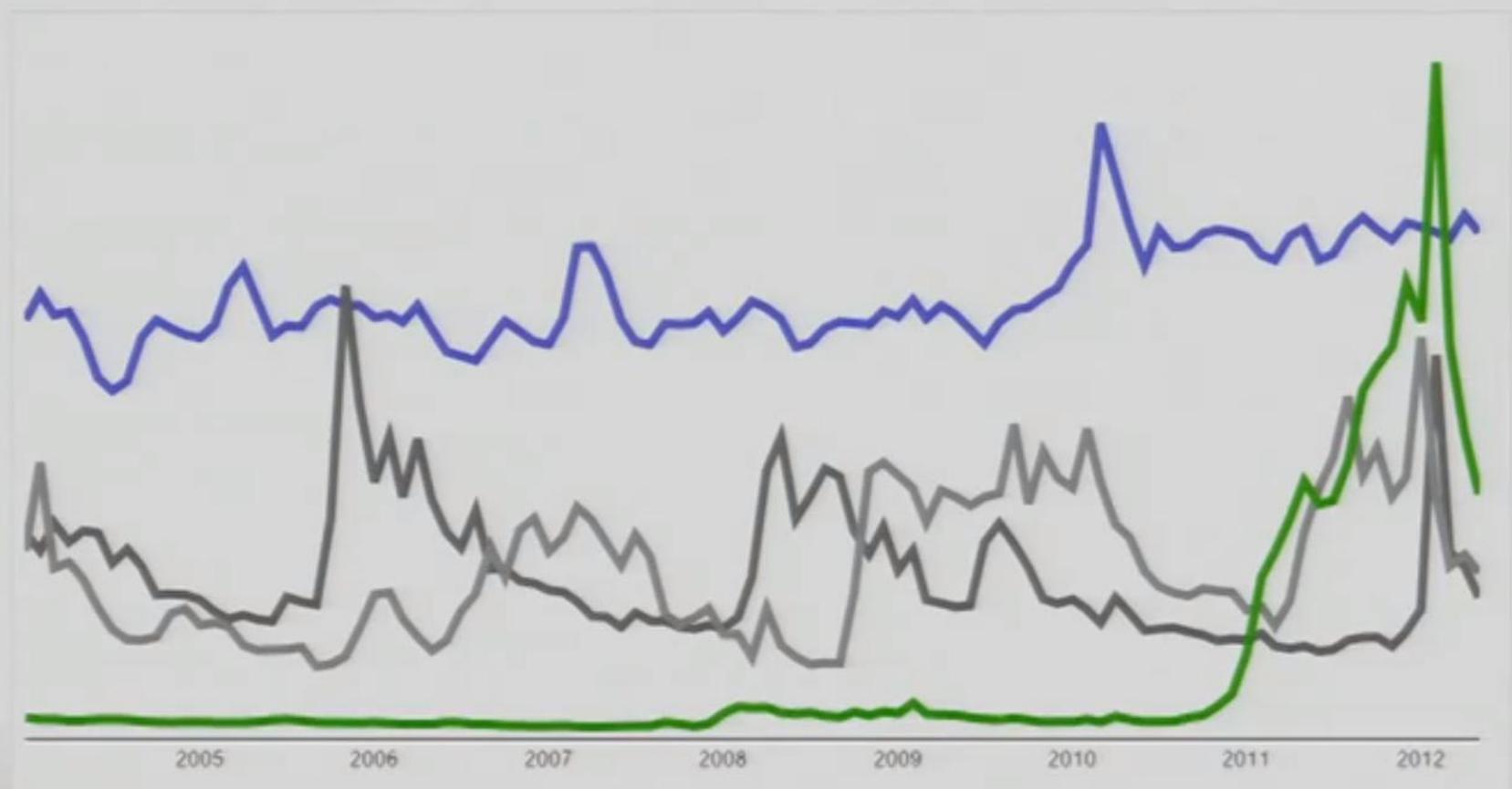
# Reaching for the stars



# Reaching for the stars

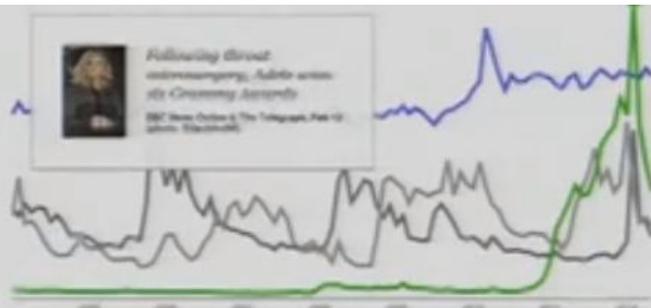


# Reaching for the stars



# Data Column Roles

## Scope and Tooltip

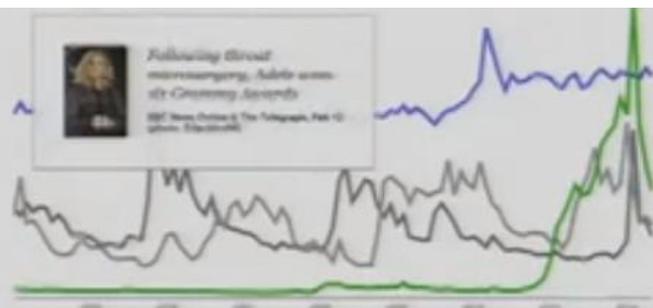


```
// Columns: [Time, Madonna, MadonnaScope, Beyonce, BeyonceScope, Adele, AdeleTooltip].
var frameView = new google.visualization.DataView(dataTable);
frameView.setColumns([
  0, // Time
  1, // Madonna
  // All data values are marked with 'scope': false, making the entire series out-of-scope.
  { role: 'scope', type: 'boolean', calc: function(dataTable, row) { return false; } },
  2, // Beyonce
  { role: 'scope', type: 'boolean', calc: function(dataTable, row) { return false; } },
  3, // Adele
  { role: 'tooltip', type: 'string',
    calc: function(dataTable, row) { return getHTMLTooltipContent('Adele', row); } }
]);
chart.draw(frameView, options);
```

JAVASCRIPT

# Data Column Roles

## Scope and Tooltip



```
// Columns: [Time, Madonna, MadonnaScope, Beyonce, BeyonceScore, Adele, AdeleTooltip]
var frameView = new google.visualization.DataView(dataTable);
frameView.setColumns([
  0, // Time
  1, // Madonna
  // All data values are marked with 'scope': false, making the entire series out-of-scope.
  { role: 'scope', type: 'boolean', calc: function(dataTable, row) { return false; } },
  2, // Beyonce
  { role: 'scope', type: 'boolean', calc: function(dataTable, row) { return false; } },
  3, // Adele
  { role: 'tooltip', type: 'string',
    calc: function(dataTable, row) { return getHTMLTooltipContent('Adele', row); } }
]);
chart.draw(frameView, options);
```

JAVASCRIPT

# Animation

## View Window Animation

JAVASCRIPT

```
// Draw data for entire timeline (2004-2012).
options.hAxis.viewWindow = { min: new Date(2004, 0, 1), max: new Date(2012, 5, 1) };
google.visualization.events.addListener(chart, 'ready', zoomInTo2005);
chart.draw(data, options);
function zoomInTo2005() { // Perform animated zoom-in to 2005.
  options.hAxis.viewWindow = { min: new Date(2005, 0, 1), max: new Date(2005, 11, 31) };
  options.animation = { duration: 2000 }; // In milliseconds
  google.visualization.events.addListener(chart, 'animationfinish', panTo2006);
  chart.draw(data, options);
}
function panTo2006() { // Perform animated panning to 2006.
  // Same as above. View window size has not changed, so animation will pan (not zoom).
  options.hAxis.viewWindow = { min: new Date(2006, 0, 1), max: new Date(2006, 11, 31) };
  options.animation = { duration: 1000 }; // In milliseconds
  chart.draw(data, options);
}
```

# Animation

## View Window Animation

JAVASCRIPT

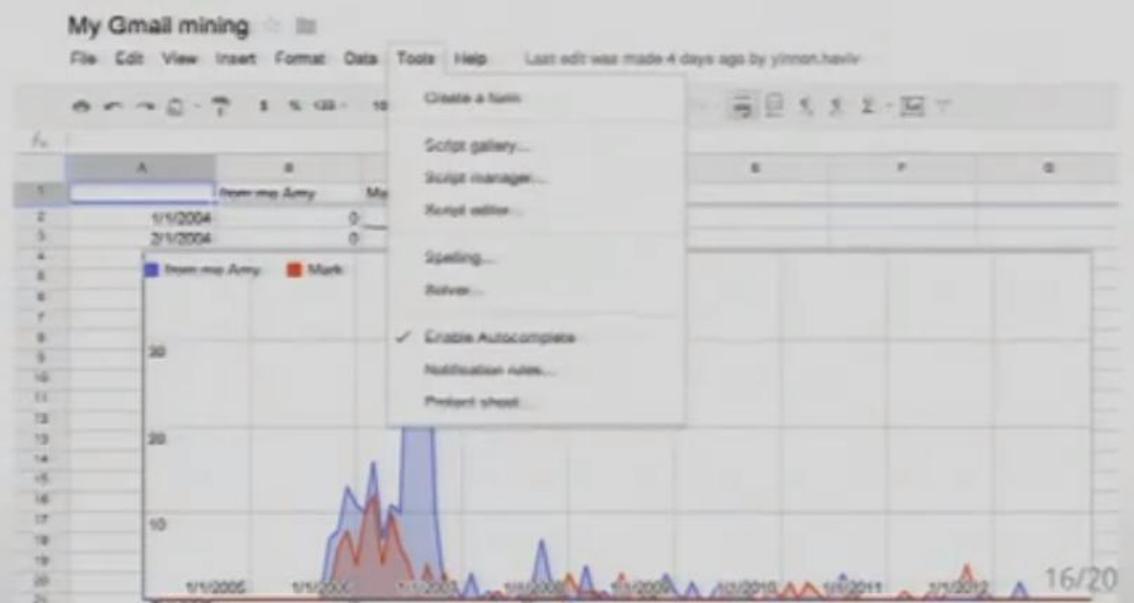
```
// Draw data for entire timeline (2004-2012)
options.hAxis.viewWindow = { min: new Date(2004, 0, 1), max: new Date(2012, 5, 1) };
google.visualization.events.addListener(chart, 'ready', zoomInto2005);
chart.draw(data, options);

function zoomInto2005() { // Perform animated zoom-in to 2005
  options.hAxis.viewWindow = { min: new Date(2005, 0, 1), max: new Date(2005, 11, 31) };
  options.animation = { duration: 2000 }; // In milliseconds
  google.visualization.events.addListener(chart, 'animationfinish', panTo2006);
  chart.draw(data, options);
}

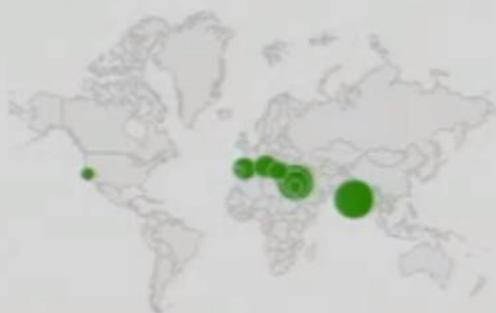
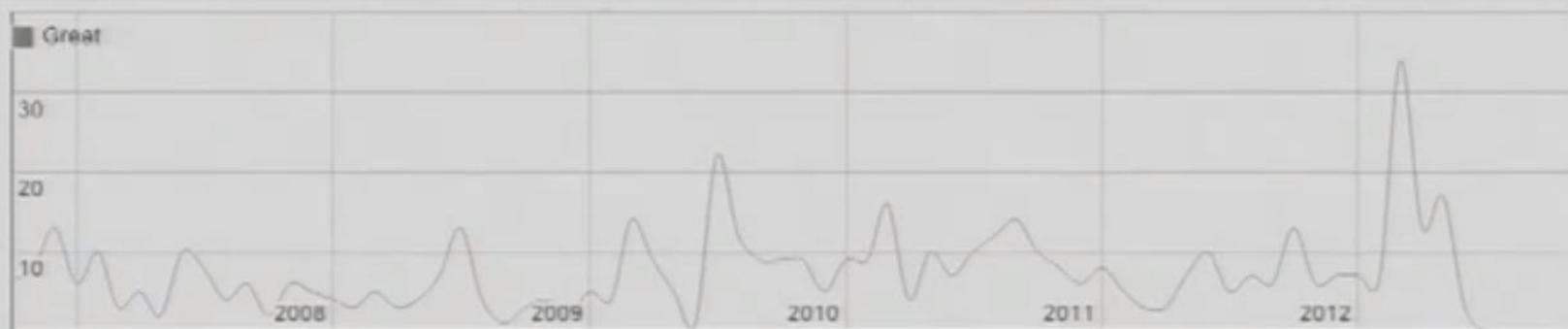
function panTo2006() { // Perform animated panning to 2006
  // Same as above. View window size has not changed, so animation will pan (not zoom).
  options.hAxis.viewWindow = { min: new Date(2006, 0, 1), max: new Date(2006, 11, 31) };
  options.animation = { duration: 1000 }; // In milliseconds
  chart.draw(data, options);
}
```

# The story of you - [goo.gl/xw9C3](http://goo.gl/xw9C3)

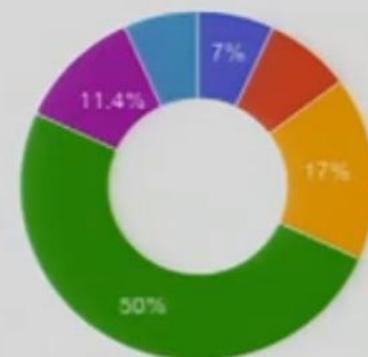
- Make your own copy of this spreadsheet
- Replace "Dan" and "David" with names of two friends
- Open Tools->Script Editor...
- Click RUN button and grant gmail access approvals to the script
- Run again and wait a few seconds for the data to load



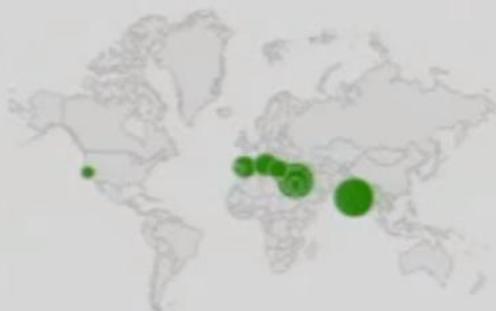
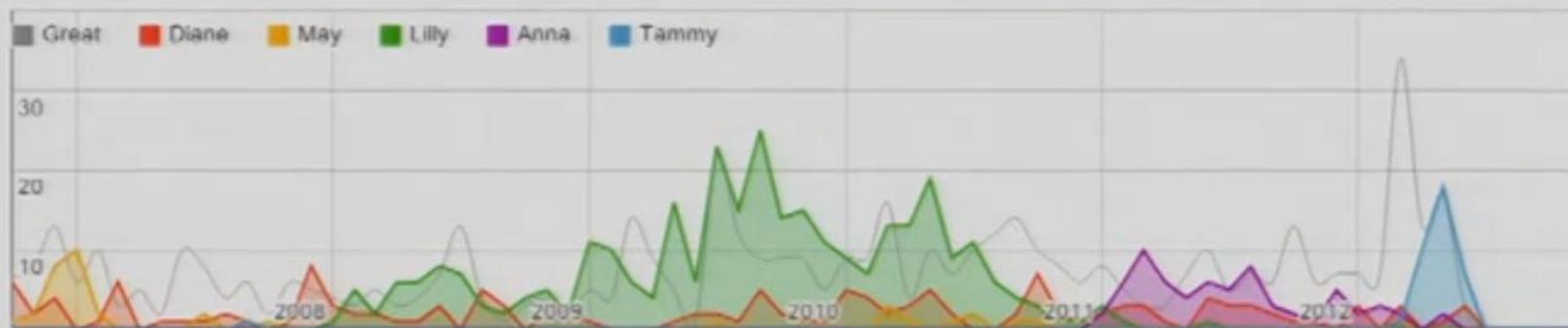
# The story of me



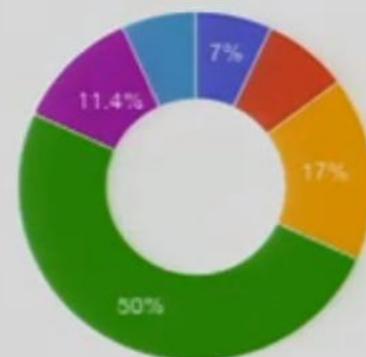
Areas of interest



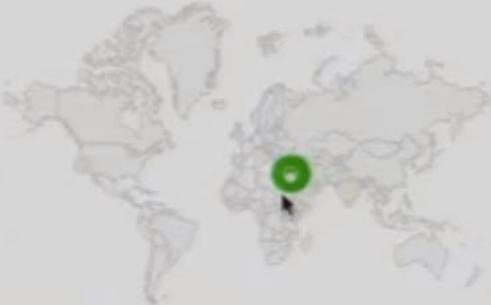
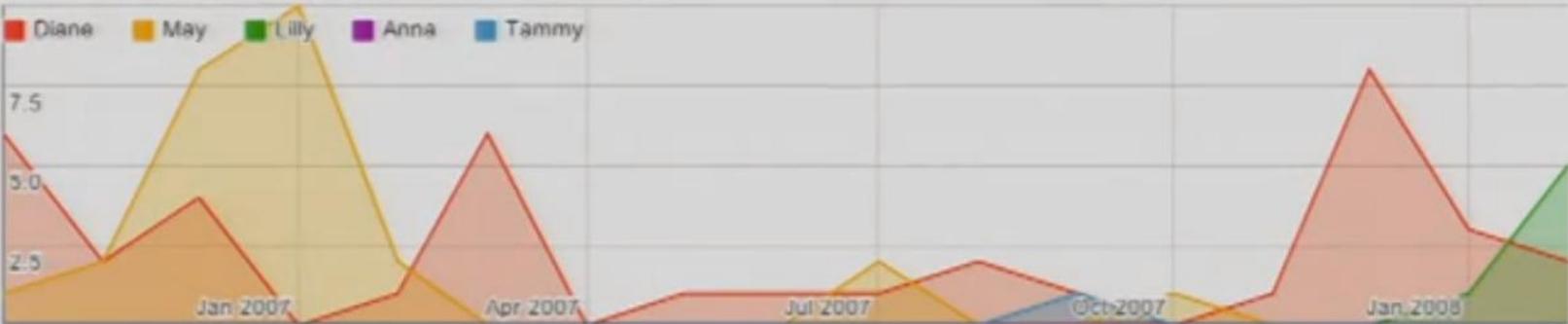
# The story of me



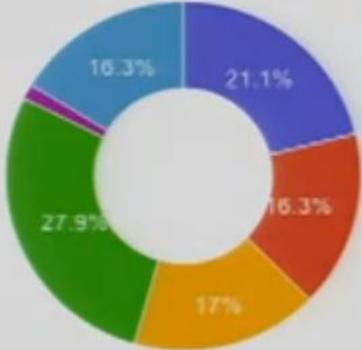
Areas of interest



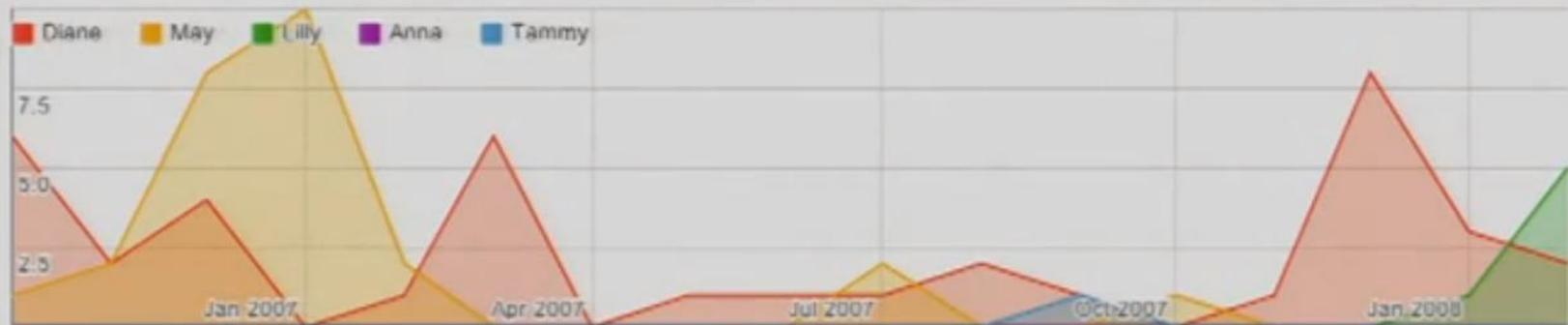
# The story of me



Areas of interest



# The story of me



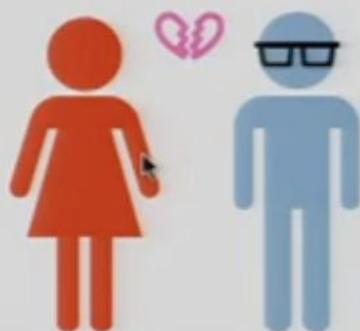
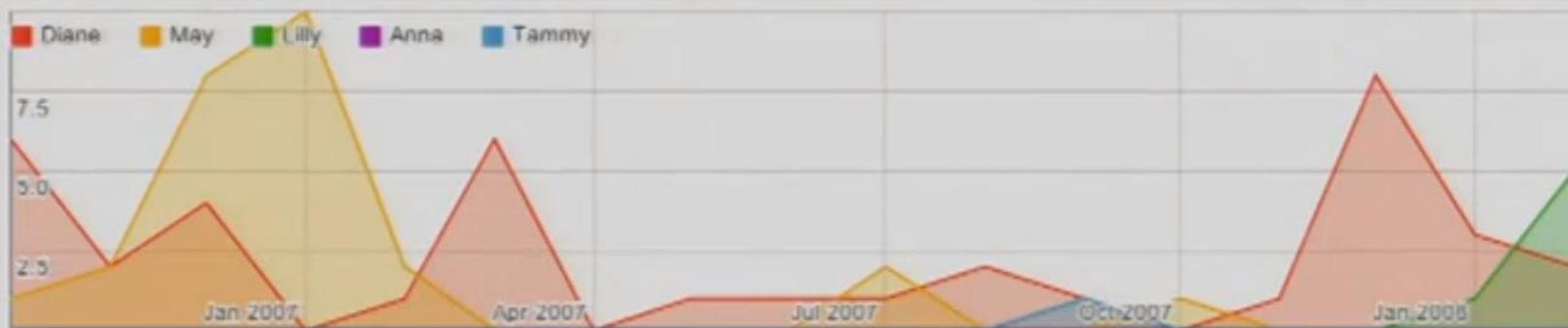
*Sane*  
*Pretty*  
*Interesting*  
*Fun*

-- John the wise

## The 2-traits theorem

Sane			Anna	Tammy
Pretty	May			Tammy
Interesting		Lilly		Tammy
Fun		Lilly	Anna	Tammy

# The story of me



## The 2-traits theorem

Sane			
Pretty			
Interesting			
Fun			

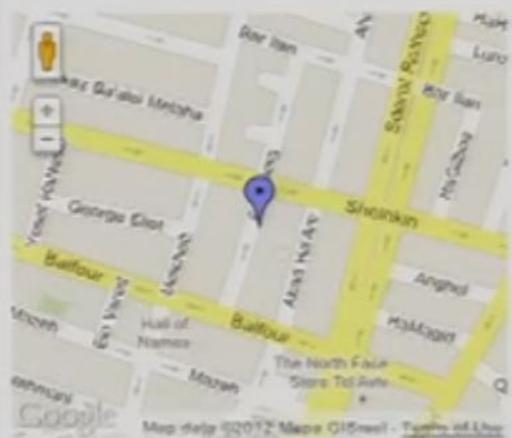
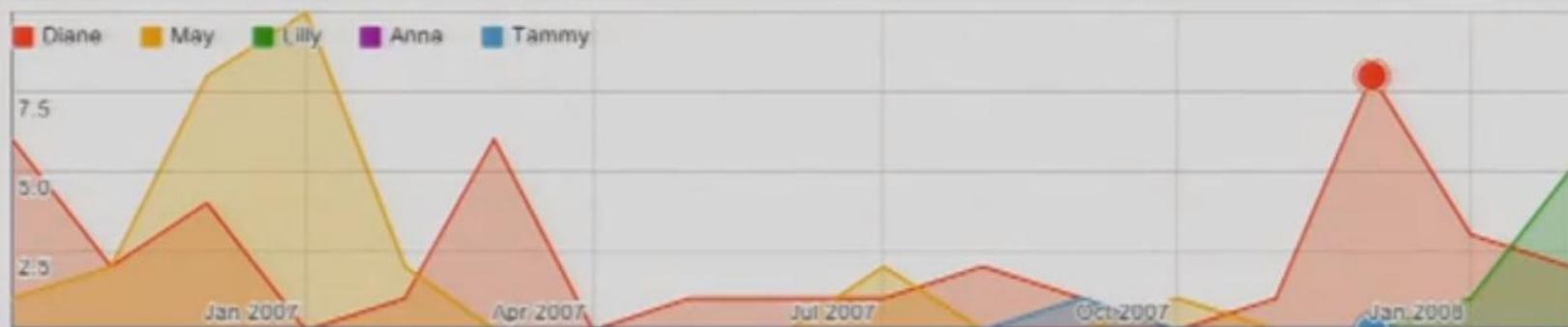
# The story of me



## The 2-traits theorem

Sane			
Pretty			
Interesting			
Fun			

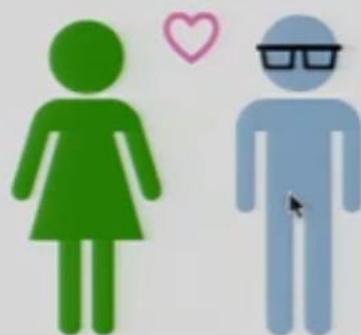
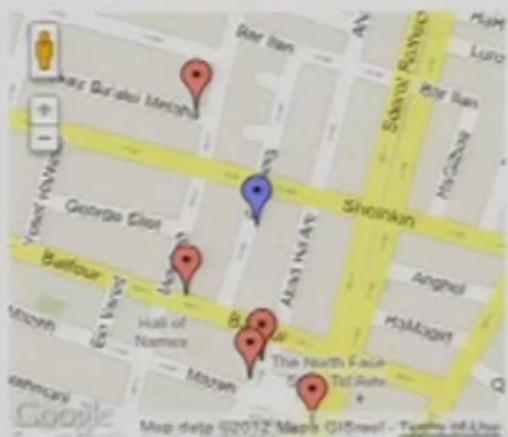
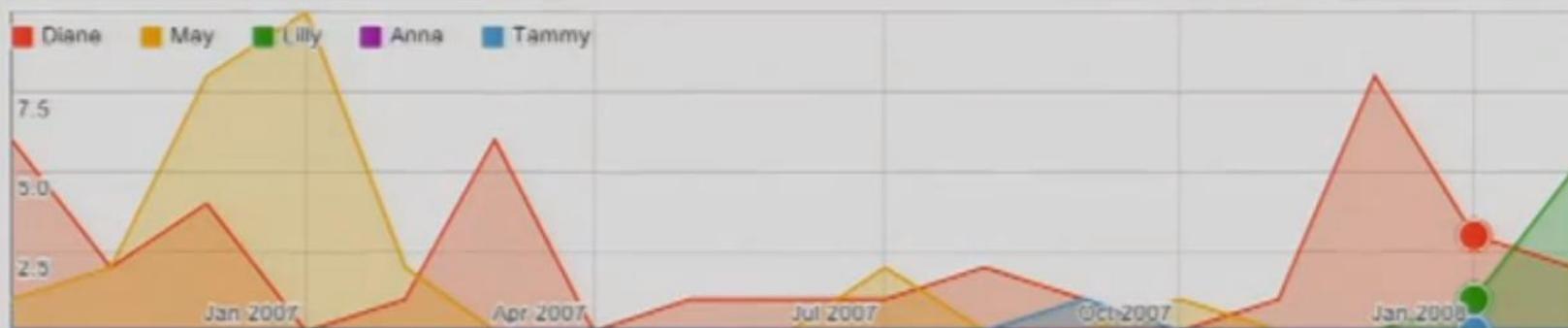
# The story of me



## The 2-traits theorem

Sane	Grey	Blue
Pretty	Grey	Blue
Interesting	Grey	Blue
Fun	Grey	Blue

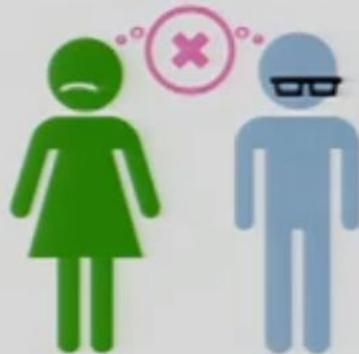
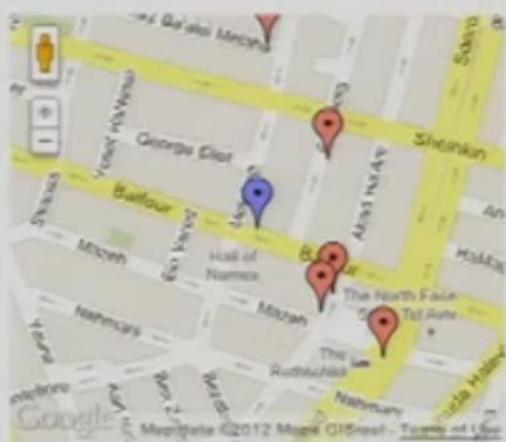
# The story of me



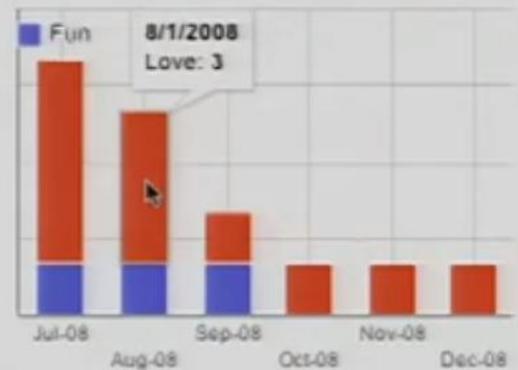
## The 2-traits theorem

Sane			
Pretty			
Interesting			
Fun			

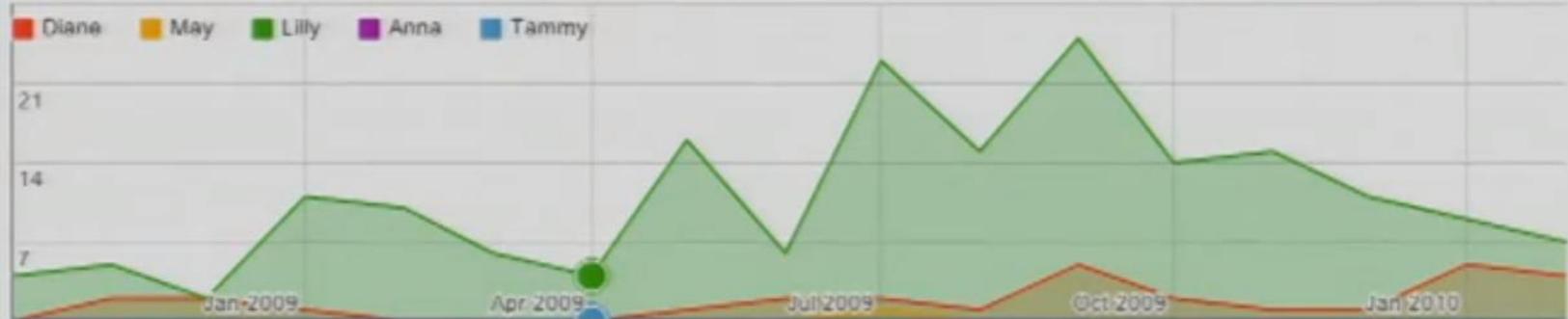
# The story of me



## How am I feeling?



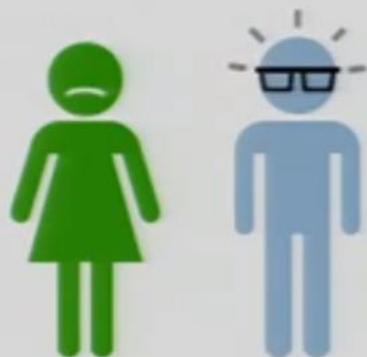
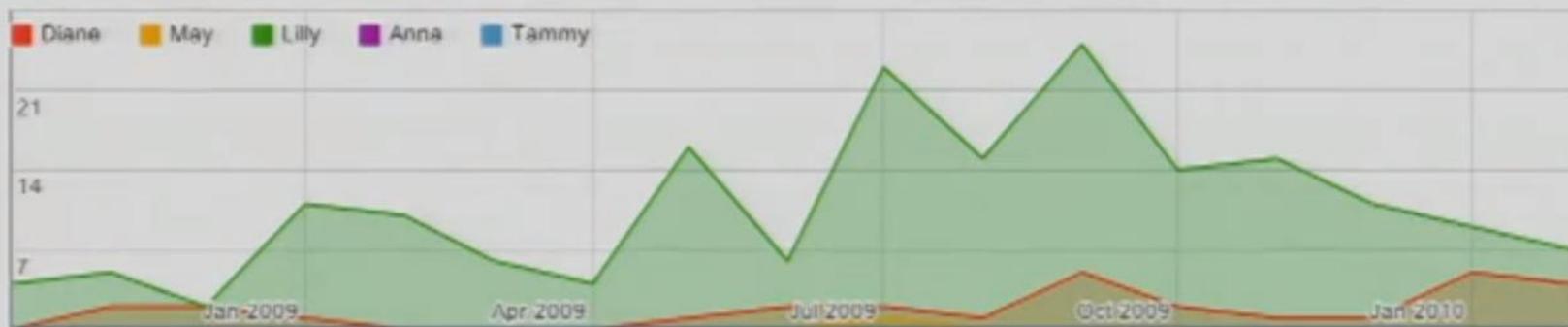
# The story of me



## The 2-traits theorem

Sane			
Pretty			
Interesting			
Fun			

# The story of me

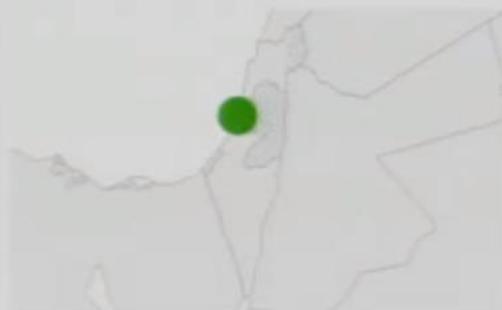
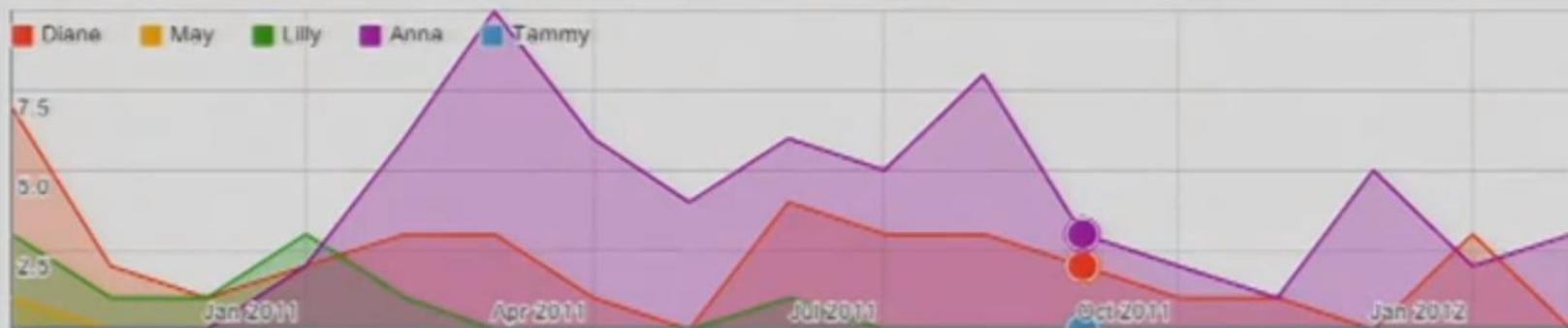


## How am I feeling?





# The story of me



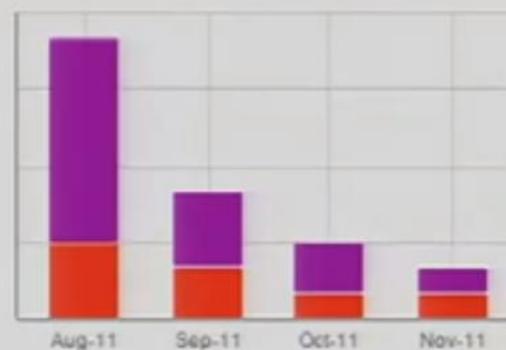
COMPOSE

Inbox (1)

Starred

Imnotant

Emails to:





# Summary

	Data exploration	Storytelling
Model	A graph of all slices and legal transitions	A path of deliberate transitions
Component	Exponential	Linear
Point of view	Unbiased	Agenda driven
User	Active	Passive
Response	Overwhelming	Interesting

---

<Thank You!>

<https://developers.google.com/chart/>

Yinnon Haviv - Software Engineer, Google

Michael Fink - Product Manager, Google

