

**Analytics** is the discovery and communication of meaningful patterns in data.

## **Today's Agenda:**

1. Some context on big data & analytics
2. What is the goal of your app?
3. Event data
4. Common analytics methods
5. Hands-on integration exercise

**First:** some context on big data and analytics

Every company is becoming a **software company**.  
Every software company is becoming a **data company**.

# “Big Data” and “Analytics” are kind of a thing right now.

WSJ WSJ LIVE MARKETWATCH BARRON'S ALLTHINGS.DI FACTIVA RISK & COMPLIANCE

## THE WALL STREET JOURNAL.

U.S. EDITION Sunday, April 29, 2012 As of 9:44 AM EDT

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TOP STORIES IN Technology 1 of 12 Apple, Samsung Back in Court 2 Kodak Gets Bid of More Than \$500 Million for Paten

April 29, 2012, 9:44 a.m. ET

### Big Data's Big Problem: Little Talent

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It seems that the markets are as much in love with "Big Data"—the ability to acquire, process and sort vast quantities of data in real time—as the technology industry.



Hilary Mason, chief scientist for the URL shortening service Bitly, outlines the key skills that data scientists must have.

The first Big Data initial public offering hit the market last week to roaring approval. [Splunk Inc., SPLK +0.31%](#) which helps businesses organize and make sense of all the information they gather, soared 109% on its first day of trading. Big Data, big price.

And this week, in cities in the U.S. and the U.K., Big Data Week events are being held to proselytize the unbelievers.

Big Data refers to the idea that an organization can mine all the data it collects right

Harvard Business Review

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THE MAGAZINE October 2012

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### Data Scientist: The Sexiest Job of the 21st Century

by Thomas H. Davenport and D.J. Patil

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Artwork: Tamar Cohen, Andrew J. Buboltz, 2011, silk screen on a page from a high school yearbook, 8.5" x 12"

When Jonathan Goldman arrived for work in June 2006 at LinkedIn, the business networking site, the place still felt like a start-up. The company had just under 8 million accounts, and the number was growing quickly as existing members invited their friends and colleagues to join. But users weren't seeking out connections with the people who were already on the site at the rate executives



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We have a Sr. Analytics & Optimization Manager opportunity in  
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1h



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4h

#jobs #imedia Business Analyst - Web Analytics - TechnoSphere, Inc  
- Atlanta, GA: Deep understa... [bit.ly/120EoDF](http://bit.ly/120EoDF) #web #analytics

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7h

Web Analyst for LBI! [wp.me/p2jx2J-9e](http://wp.me/p2jx2J-9e) via @NuCreatives  
#webanalyst #jobs #LBI #Nucreatives #analytics [dlvr.it/2bMzc3](http://dlvr.it/2bMzc3)

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**Terry** @TerryJobs

5 Dec

Use Google #Analytics to Improve Your #SocialMedia Strategy ...  
#Recruiter #Jobs #SocialRecruiting [lnkd.in/Si-C6h](http://lnkd.in/Si-C6h)

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**Anametrix** @anametrix

5 Dec

Join the #Digital #Analytics Revolution! @anametrix is hiring! Lots of  
positions available. --> [bit.ly/VjwZ1O](http://bit.ly/VjwZ1O) #jobs

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**Zillion Jobs** @ZillionJobs

5 Dec

Business Analytics Manager Job (Olathe, KS) [zillionjobs.com/Job-6665643.htm](http://zillionjobs.com/Job-6665643.htm)... #Analytics #Manager #job #jobs #Olathe

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**RosettaCareers** @RosettaCareers

4 Dec

We are looking for an Analytics Director in Cleveland w/8+ yrs  
#measure exp, apply here [lnkd.in/uzBE-M](http://lnkd.in/uzBE-M) or DM me #jobs  
#analytics

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**Social Media Club** @SMCSTL

3 Dec

Know a good fit for this role? > Senior Manager, Digital Bear  
Marketing #STL #Jobs #SMCSTL  
[careers.buildabear.com/Careers.aspx](http://careers.buildabear.com/Careers.aspx) #Analytics #SocialMedia

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**Michael Young** @michaelyoungMBN

2 Dec

"@mbnrecruitment: #Jobs Senior Analytics & Optimization Manager -  
£50000 - £60000 pa [bit.ly/VgoB3L](http://bit.ly/VgoB3L)" #bigdata #sql #SAS #Analytics  
from Glasgow City, Glasgow City

# job security.

# Cool data stories



Tycho Brahe



Johannes Kepler



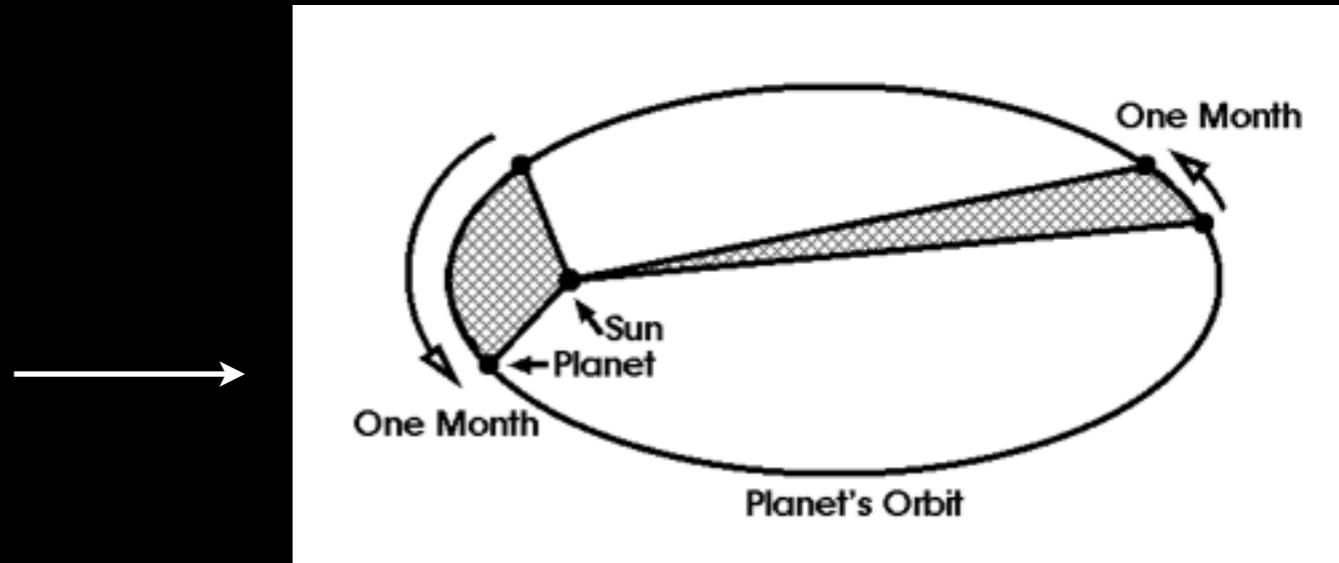
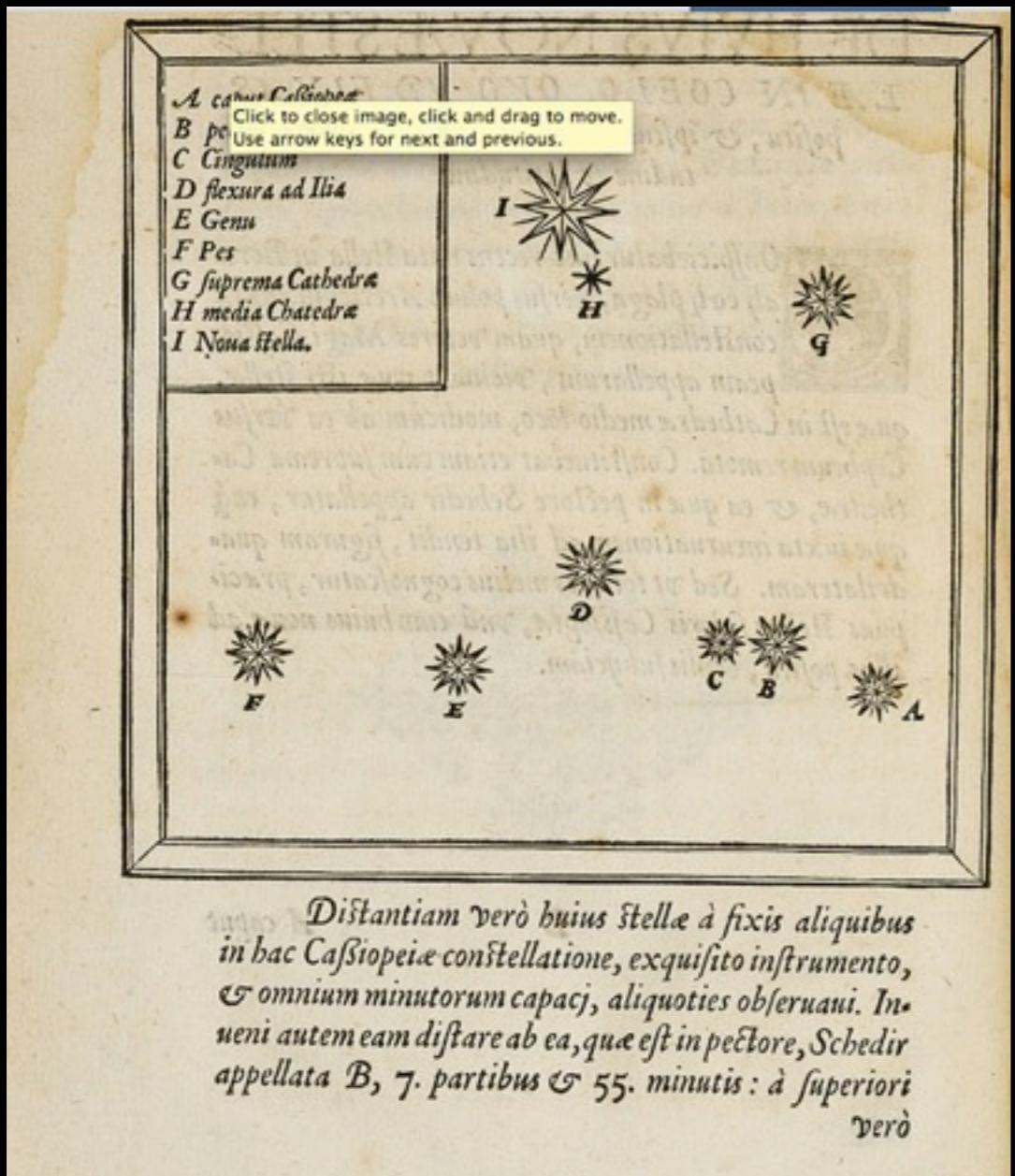
Tycho Brahe



Johannes Kepler



aka science walrus



*Distantiam verò huius Stellæ à fixis aliquibus  
 in bac Cassiopeiæ constellatione, exquisito instrumento,  
 & omnium minutorum capacj, aliquoties obseruani. In-  
 ueni autem eam distare ab ea, quæ est in pectore, Schedir  
 appellata B, 7. partibus & 55. minutis: à superiori  
 verò*

Tycho Brahe

Johannes Kepler

LinkedIn Account Type: Basic | Upgrade 23 1

Michelle Wetzler Add Connections

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£50m new investment in London's Tech City David C.

Ben Horowitz: The

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ADS BY LINKEDIN MEMBERS



**Build Huge Email List?**  
Social media can increase your leads & sales within few weeks. Check it out



LinkedIn <linkedin@e.linkedin.com>

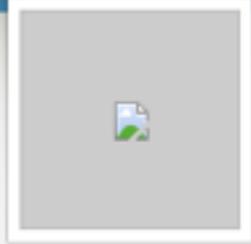
to me ▾

1:03 PM (1 hour ago) ★



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This email was intended for Michelle Wetzler (Director at Keen IO). [Learn why we include this](#).

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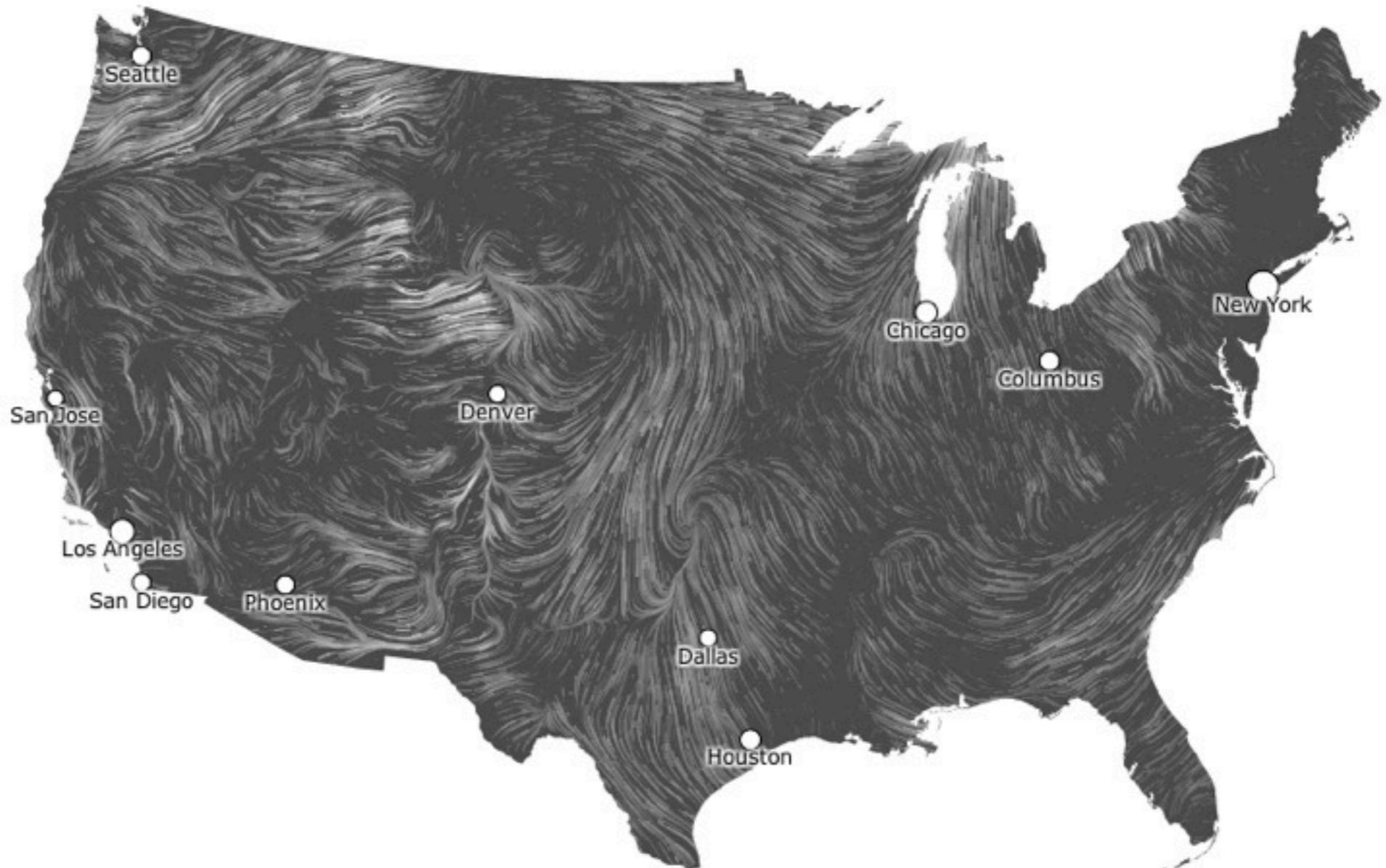
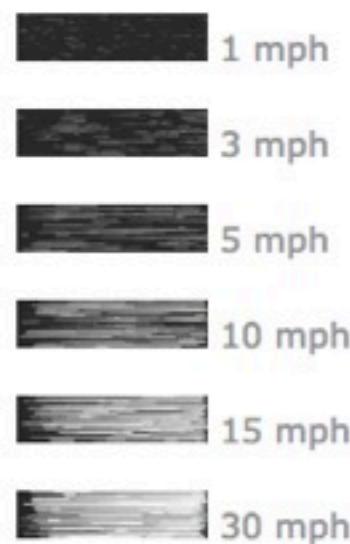
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**Dec. 6, 2012**

5:59 pm EST

(time of forecast download)

top speed: **30.2 mph**  
average: **6.2 mph**



<http://hint.fm/wind/>

<http://infosthetics.com/>



# Le Petit Journal

ADMINISTRATION  
61, RUE LAFAYETTE, 61

Les manuscrits ne sont pas rendus

On s'abonne sans frais  
Dans tous les bureaux de poste

5 CENT. SUPPLÉMENT ILLUSTRÉ 5 CENT.

23<sup>e</sup> Année ————— Numéro 1.150

DIMANCHE 1<sup>er</sup> DÉCEMBRE 1912

ABONNEMENTS

	PAR MOIS	EN AN
SEINE ET SEINE-ET-OISE	2 fr.	24 fr. 80
DÉPARTEMENTS	2 fr.	4 fr. *
ÉTRANGERS	2.80	32 fr. *



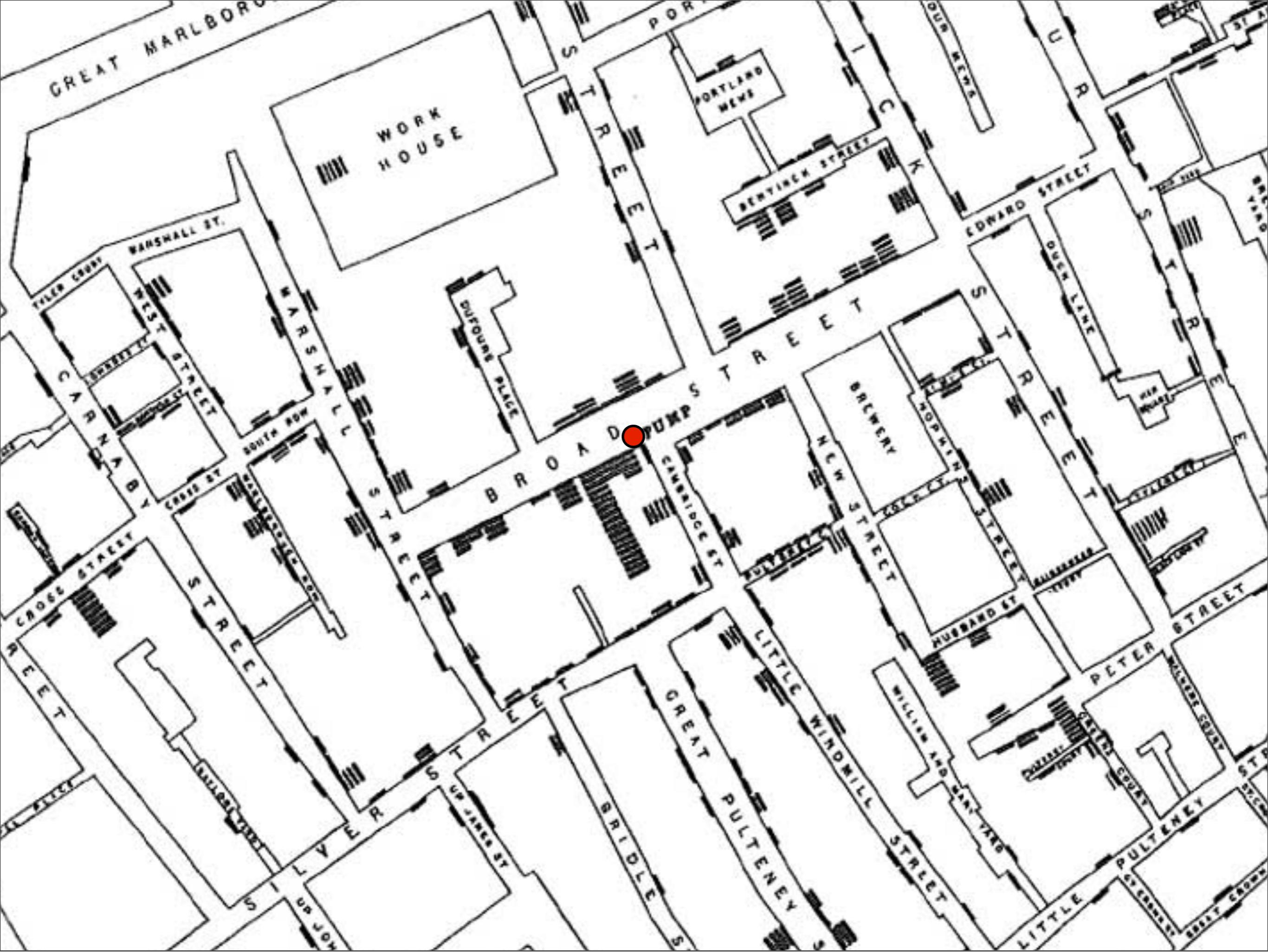
LE CHOLÉRA



John Snow

Figured out Cholera  
spreads through water.

No one believed him :(



**Next:** applying analytics to your business

Use analytics to measure progress toward a goal.  
Use analytics to test new hypotheses.  
Use analytics to explore.

## **Exercise! - 1 minute**

What is the goal of your app?

Write down at least one goal for an app.  
Be prepared to share it with the class.

# A common goal: engagement

- Downloads
- App Launches
- Account creations
- Views
- Posts
- Shares/Tweets/Likes
- Purchases

# Introducing Event Data



**Actions & State + Time**

```
purchase = {  
    timestamp: 2012-06-06T19:10:39.205000,  
    item: "sophisticated orange turtleneck with deer on it",  
    cost: 469.5,  
    payment_method: "Bank Simple VISA",  
    customer: {  
        name: "Francis Woodbury",  
        age: 28,  
        personality: "sullen",  
    },  
    store: {  
        name: "Yupster Things",  
        city: "San Francisco",  
        state: "California"  
        address: : "467 West Portal Ave",  
    }  
};
```

# Action (verb)

```
purchase = {  
    timestamp: 2012-06-06T19:10:39.205000,  
    item: "sophisticated orange turtleneck with deer on it",  
    cost: 469.5,  
    payment_method: "Bank Simple VISA",  
    customer: {  
        name: "Francis Woodbury",  
        age: 28,  
        personality: "sullen",  
    },  
    store: {  
        name: "Yupster Things",  
        city: "San Francisco",  
        state: "California"  
        address: : "467 West Portal Ave",  
    }  
};
```

Time

State  
(nouns)

# Example Data Model

- App: Vine
- Events: Start Recording, Complete Recording, Upload, Tag, Share, Favorite, Comment, Delete
- Nouns: User, Session, App, Device/Platform, Video, Comment, Tag

# More Examples

**Verbs:** Signup, Login, Upgrade, Submit, Scroll, Send, Share, Search, Check-In, Vote, Update, Purchase, Level Up, Fail, Favorite, Vote, Crash, Rate, Start, Modify, Check, View, Capture

**Nouns:** User, Company, Organization, Team, Platform, Device, App, Level, Garden, Favorites, Interests, Inventory, Cart, Video, Location, Item, Record, Product, Account, Form, Picture, Story

# Rules of thumb for event data

- Describe your app to a stranger and listen to the words you use.
- Verbs are the actions you should record.
- Nouns are the important contextual information you should include in your data model.
- Most apps can be very robustly described by 5-10 key events and 5-10 key nouns.

## **Exercise! - 2 minutes**

Recall your goal from the previous exercise.

What events & properties should you record to measure your progress toward your goal?

## **Exercise! - 10 minutes**

Pair with the person next to you.

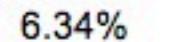
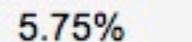
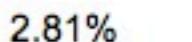
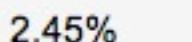
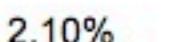
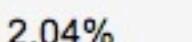
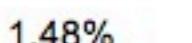
Pick 1 event (action) in your app (or theirs) and create a data model for it. What nouns and properties can you record for this event?

Prepare to share your results with the class.

**Next:** Common Analytics Techniques

# Segmentation / Filtering

- Sorting data into buckets. Commonly used to sort users into groups.
- Examples: Gender, Age, Location, Department, Referrer, Version, Device
- Any property you record with an event can be used in filtering.

Country / Territory	Visits	% Visits
1. United States	33,399	 59.17%
2. Canada	3,578	 6.34%
3. United Kingdom	3,244	 5.75%
4. Australia	1,588	 2.81%
5. India	1,384	 2.45%
6. Germany	1,183	 2.10%
7. (not set)	1,153	 2.04%
8. France	838	 1.48%

## **Exercise! - 2 minutes**

Recall the event you modeled in the previous exercise.

Think of at least one property you would like to use for filtering or segmentation. Be prepared to share it with the class.

# A/B Testing aka Split Testing

The image shows two identical landing pages for 'Performable' side-by-side, demonstrating an A/B test. Both pages have a white header with the 'Performable' logo and a green star icon. The top navigation bar includes links for '800-255-4015 | Beta Customers Sign In | Sign Up' and a blue 'Get Started' button.

**Left Side (Control Version):**

- Headline:** Stop closing the door on potential customers. Get your message right with Performable.
- Text below headline:** Create beautiful landing pages, measure your conversions, and continuously improve your message over time.
- Call-to-action:** Get Started Now!
- Image:** A screenshot of the Performable software interface showing a landing page editor with various elements like forms and buttons.
- Section:** What can you do with Performable?
  - Icon:** Cloud with dollar sign (Ad traffic)
  - Description:** Make more money from your ad traffic. Direct send your ad traffic to a tailored ad landing page (send them to a targeted landing page instead).
  - Icon:** Camera (Video pages)
  - Description:** Sell more products using targeted video pages. Adding a video to your landing page can increase engagement & sales. Simply drag & drop it in with Performable.
  - Icon:** Compass (Business leads)
  - Description:** Acquire more business leads. By testing and optimizing your lead acquisition forms, you'll gain more customers over time.
  - Icon:** Newsletter (Newsletter subscribers)
  - Description:** Get more subscribers to your newsletter. Create a great newsletter sign-up page by testing out different variations to find out what works best.
  - Icon:** Contact form (Web site contact form)
  - Description:** Improve your web site contact form. Increase the number of people who inquire about your business by optimizing your contact forms.
- Large Call-to-action:** Get Started Now! (in a large green button)

**Right Side (Variant Version):**

- Headline:** Stop closing the door on potential customers. Get your message right with Performable.
- Text below headline:** Create beautiful landing pages, measure your conversions, and continuously improve your message over time.
- Call-to-action:** Get Started Now!
- Image:** A screenshot of the Performable software interface showing a landing page editor with various elements like forms and buttons.
- Section:** What can you do with Performable?
  - Icon:** Cloud with dollar sign (Ad traffic)
  - Description:** Make more money from your ad traffic. Direct send your ad traffic to a tailored ad landing page (send them to a targeted landing page instead).
  - Icon:** Camera (Video pages)
  - Description:** Sell more products using targeted video pages. Adding a video to your landing page can increase engagement & sales. Simply drag & drop it in with Performable.
  - Icon:** Compass (Business leads)
  - Description:** Acquire more business leads. By testing and optimizing your lead acquisition forms, you'll gain more customers over time.
  - Icon:** Newsletter (Newsletter subscribers)
  - Description:** Get more subscribers to your newsletter. Create a great newsletter sign-up page by testing out different variations to find out what works best.
  - Icon:** Contact form (Web site contact form)
  - Description:** Improve your web site contact form. Increase the number of people who inquire about your business by optimizing your contact forms.
- Large Call-to-action:** Get Started Now! (in a large red button)

Get Started Now!

Get Started Now!

# A/B Testing aka Split Testing

The image displays two side-by-side versions of a landing page for the company Performable. Both pages have identical top sections, including the Performable logo, a phone number (888-288-8015), and links for 'Beta Customers', 'Sign Up', and 'Log In'.

**Left Version (Green Button):**

- Headline:** Stop closing the door on potential customers. Get your message right with Performable.
- Text below headline:** Create beautiful landing pages, measure your conversions, and continuously improve your message over time.
- Call-to-action button:** Get Started Now! (green)
- Image:** A screenshot of a landing page editor interface showing a green 'HOME Corporation' button.
- Text below image:** Miss Performable's powerful editing features, you can create & publish landing pages in minutes. Test page elements & copy to find out what message works best for your business. [Enlarge](#)
- Section:** What can you do with Performable?
  - Make more money from your ad traffic
  - Sell more products using targeted video pages
  - Acquire more business leads
  - Optimize your Google Adwords campaigns
  - Get more subscribers to your newsletter
- Call-to-action button:** Get Started Now! (large green button)

**Right Version (Red Button):**

- Headline:** Stop closing the door on potential customers. Get your message right with Performable.
- Text below headline:** Create beautiful landing pages, measure your conversions, and continuously improve your message over time.
- Call-to-action button:** Get Started Now! (red)
- Image:** A screenshot of a landing page editor interface showing a red 'CRM Corporation' button.
- Text below image:** Miss Performable's powerful editing features, you can create & publish landing pages in minutes. Test page elements & copy to find out what message works best for your business. [Enlarge](#)
- Section:** What can you do with Performable?
  - Make more money from your ad traffic
  - Sell more products using targeted video pages
  - Acquire more business leads
  - Optimize your Google Adwords campaigns
  - Get more subscribers to your newsletter
- Call-to-action button:** Get Started Now! (large red button)

21% more people clicked on the red button than on the green button!

## Example of split testing data

user.name.first	user.name.last	form.version	form.fields
zach	morris	A	[first name, middle name, last name, organization]
kelly	kapowski	B	[email, password]
screech	powers	A	[first name, middle name, last name, organization]
lisa	turtle	A	[first name, middle name, last name, organization]
ac	slater	B	[email, password]
jessie	spano	B	[email, password]
mr.	belding	B	[email, password]
mrs.	culpepper	B	[email, password]
stacey	carosi	A	[first name, middle name, last name, organization]
allison	fox	B	[email, password]
tori	scott	B	[email, password]
mr.	dewey	B	[email, password]
ollie	creeky	B	[email, password]
violet	bickerstaff	B	[email, password]
rhonda	robistelli	B	[email, password]

Which version of the form was more effective?

## **Exercise! - 1 minute**

Think of something in your app you would like to A/B test.

Be prepared to share it with the class.

# Funnels

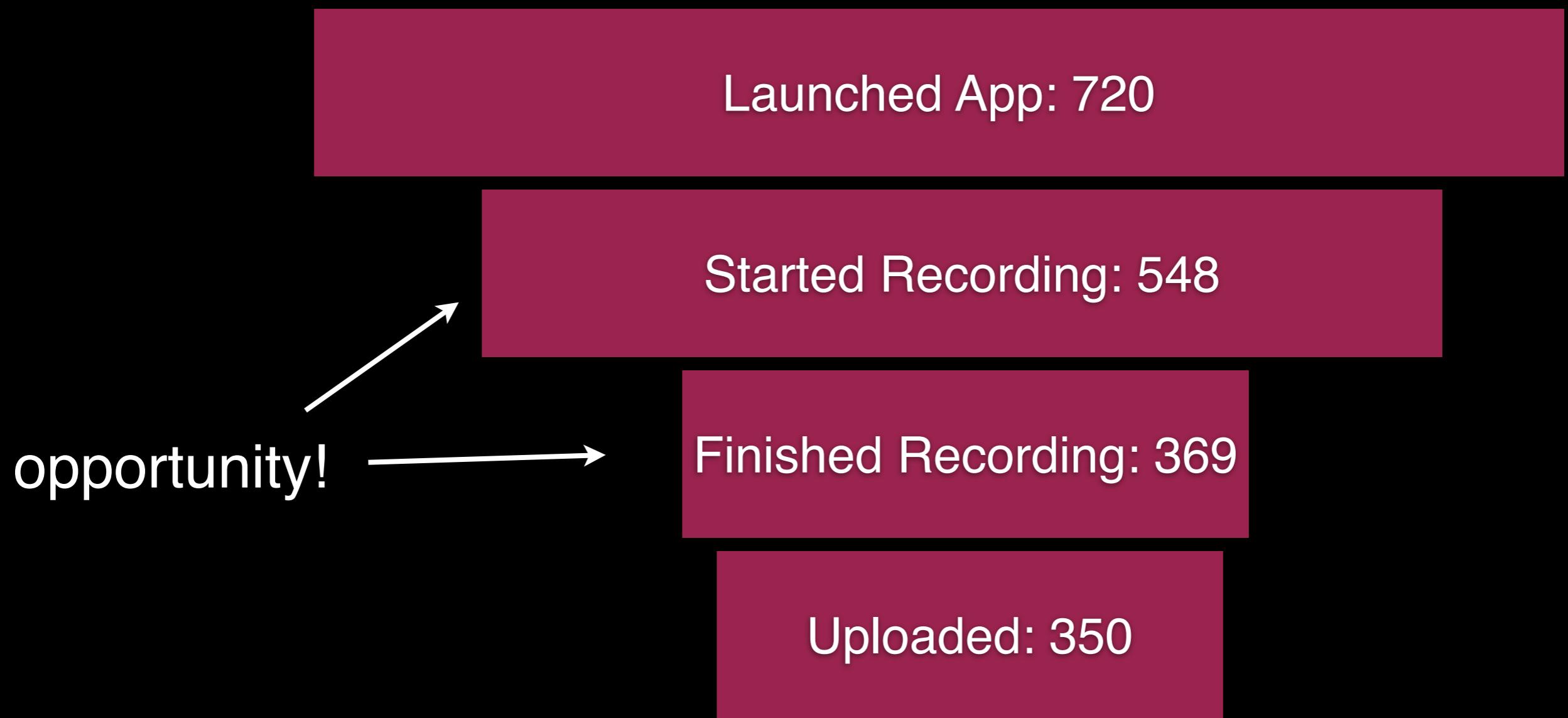
Launched App: 720

Started Recording: 548

Finished Recording: 369

Uploaded: 350

# Funnels



# Frequently used terms

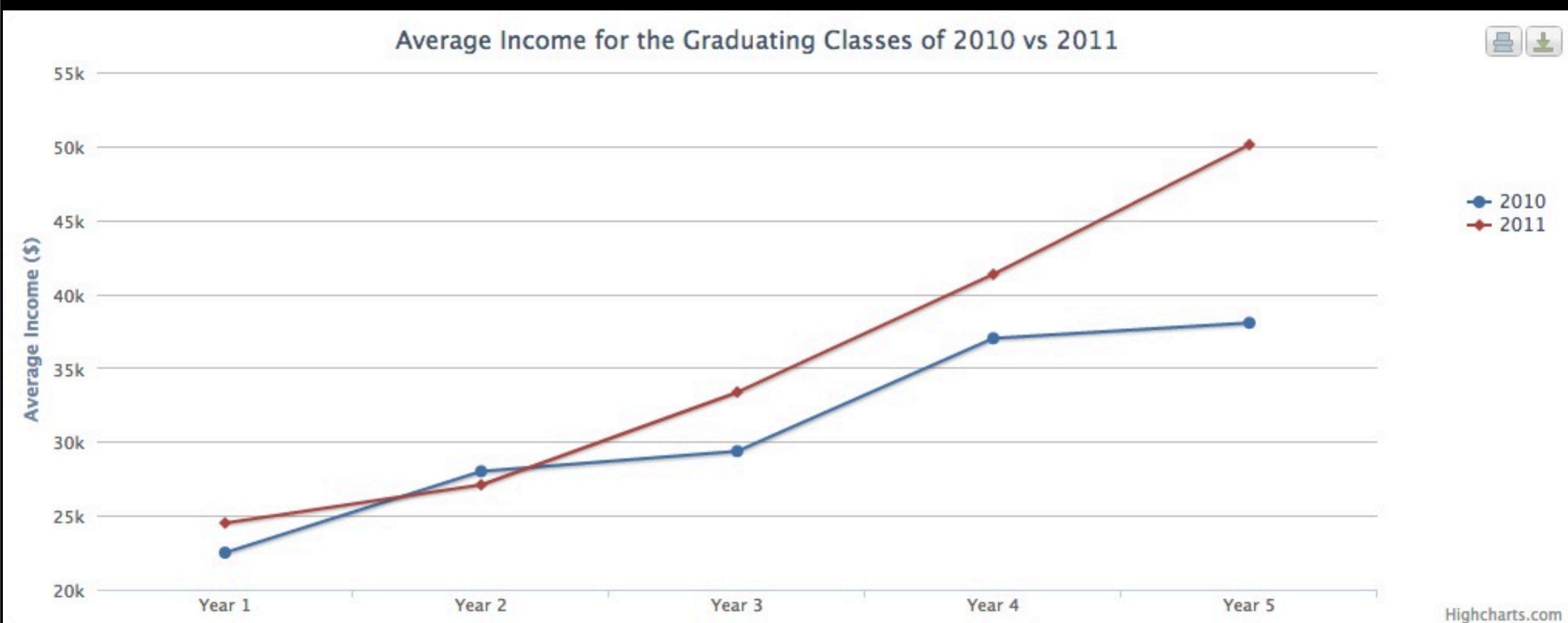
Conversion

Retention

DAU/MAU

# Cohort Analysis

A cohort is a group of people who share a common characteristic over a certain period of time.

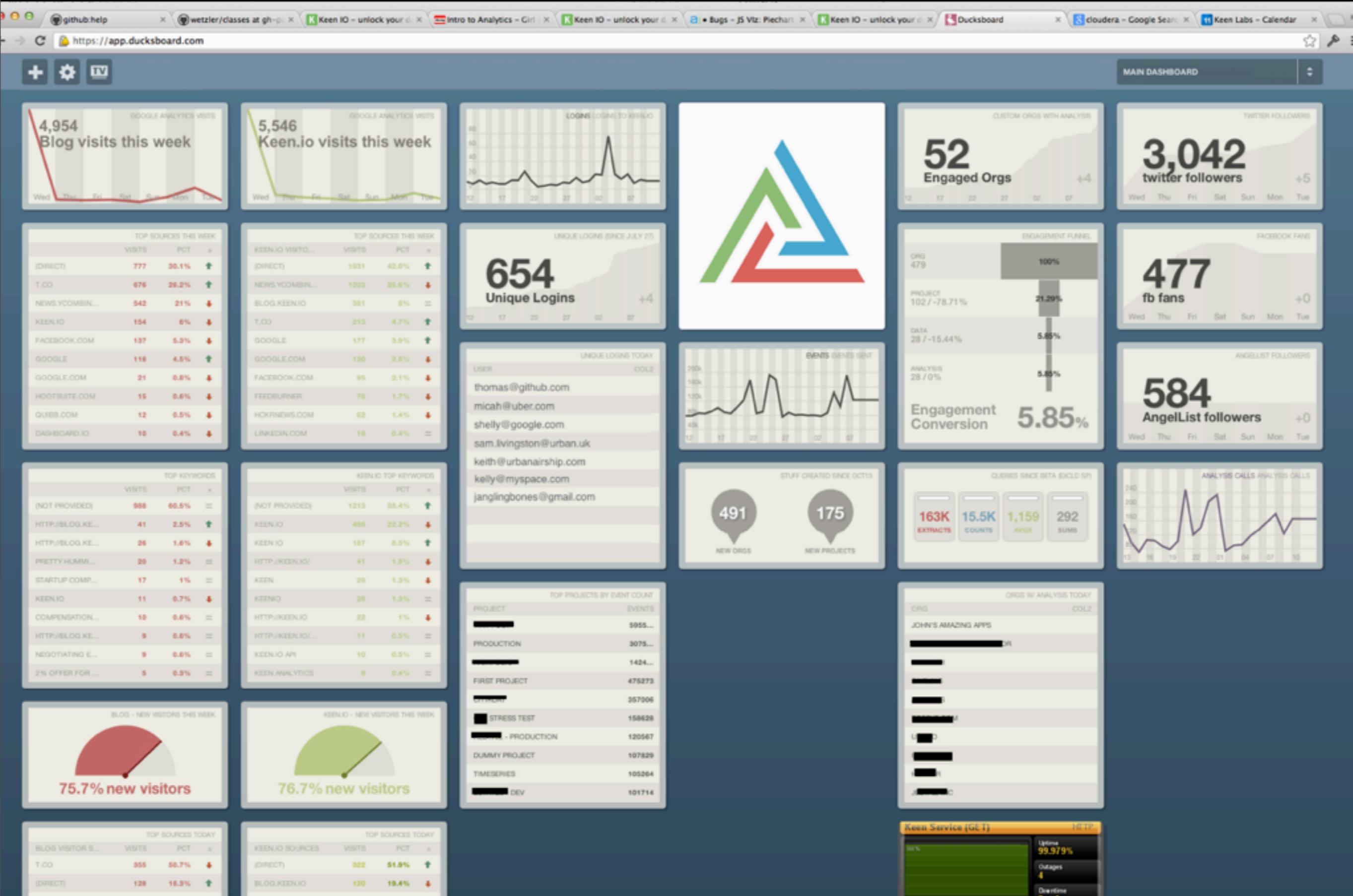


# Cohort Analysis

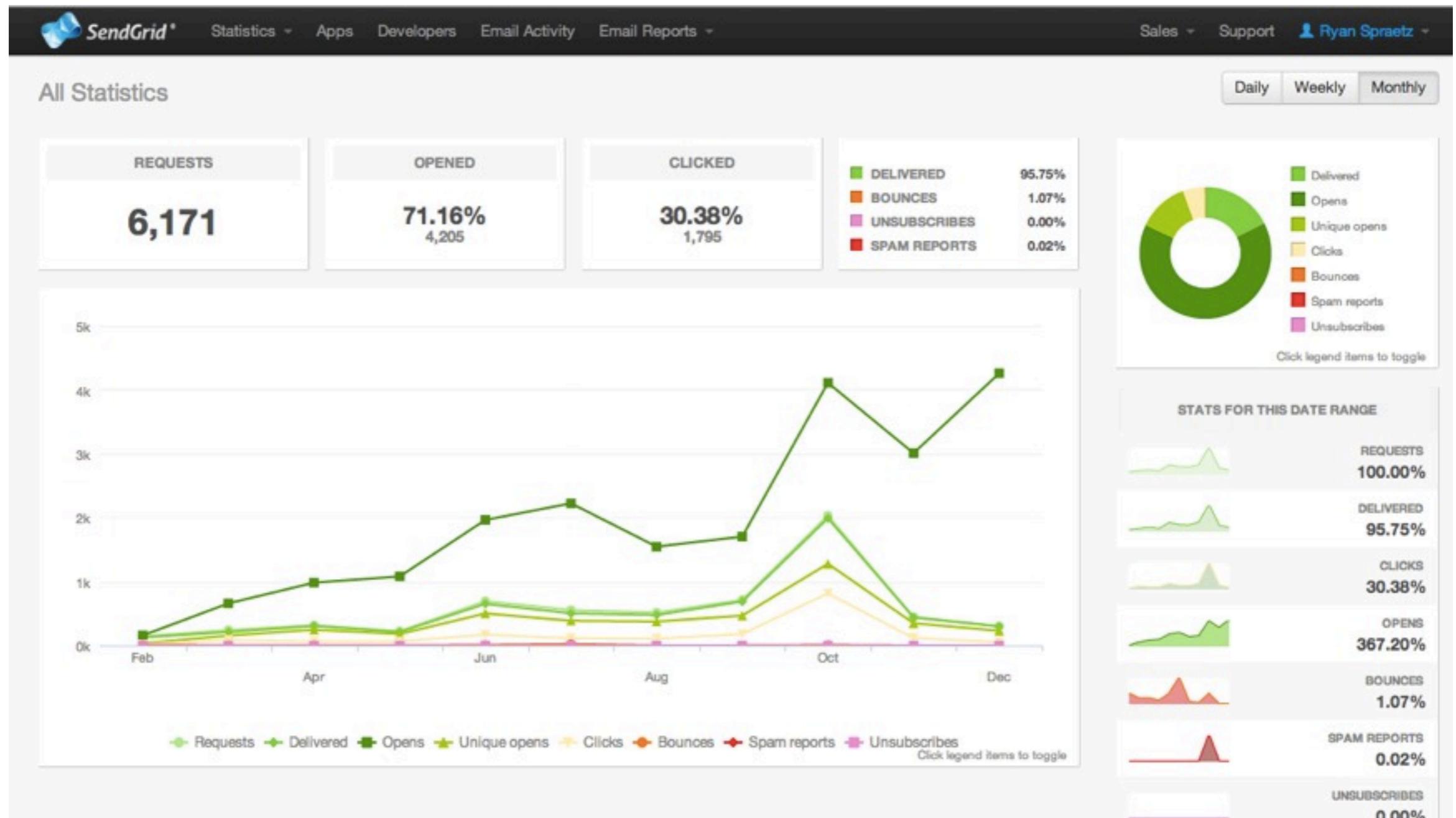
**Engagement over time**

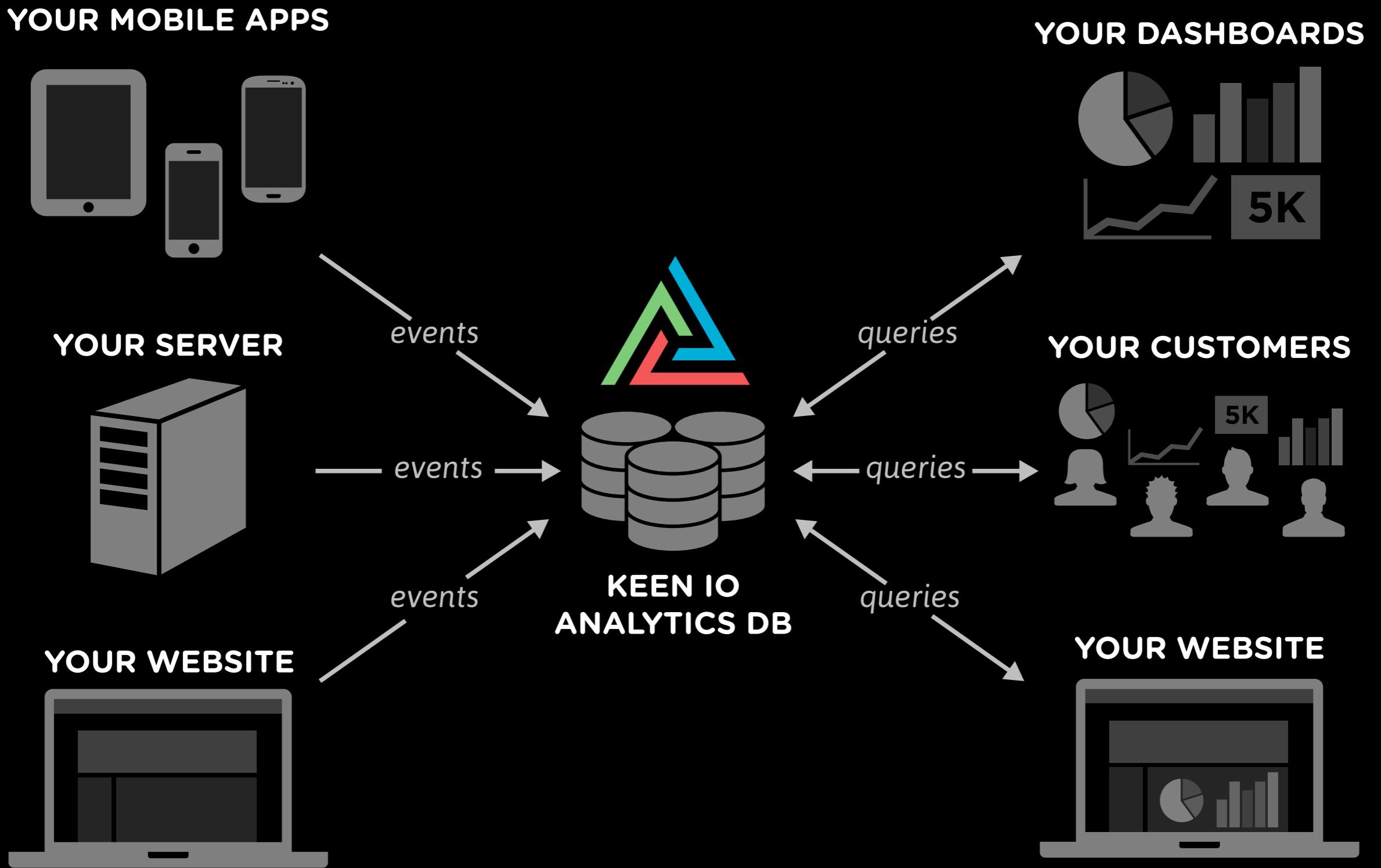
	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
(Joined in) <b>January</b>	100%	20%	19%	13%	13%	10%	12%	11%	7%	7%	7%	?
<b>February</b>	100%	21%	16%	13%	11%	9%	9%	7%	7%	7%	?	
<b>March</b>	100%	24%	20%	17%	15%	13%	11%	10%	10%	?		
<b>April</b>	100%	31%	27%	24%	19%	15%	12%	12%	?			
<b>May</b>	100%	31%	27%	25%	21%	18%	16%	?				
<b>June</b>	100%	39%	28%	24%	20%	19%	?					
<b>July</b>	100%	40%	33%	27%	23%	?						
<b>August</b>	100%	47%	41%	32%	?							
<b>September</b>	100%	52%	43%	?								
<b>October</b>	100%	53%	?									
<b>November</b>	100%	?										
<b>December</b>	?											

In this case engagement is improving nicely.  
Of the January cohort, only 20% were engaged in month 2.  
Of the October cohort, 53% were engaged in month 2.



# Email Analytics







## **Final Exercise! - rest of class**

find instructions and answers here:

<http://wetzler.github.com/classes>