



WEB ANALYTICS



DEFINITION

- Web analytics is the **measurement, collection, analysis** and **reporting** of web data for purposes of understanding and optimizing web usage.

- WAA Standards Committee. "Web analytics definitions."
Washington DC: Web Analytics Association (2008).

WHY INVEST IN WEB ANALYTICS?

- Obtain data to improve your website
- Better understand your customer
- Assess the impact of marketing promotions
- Increase conversion of website visits to revenue or revenue-generating activities

HOW IS THE DATA COLLECTED?

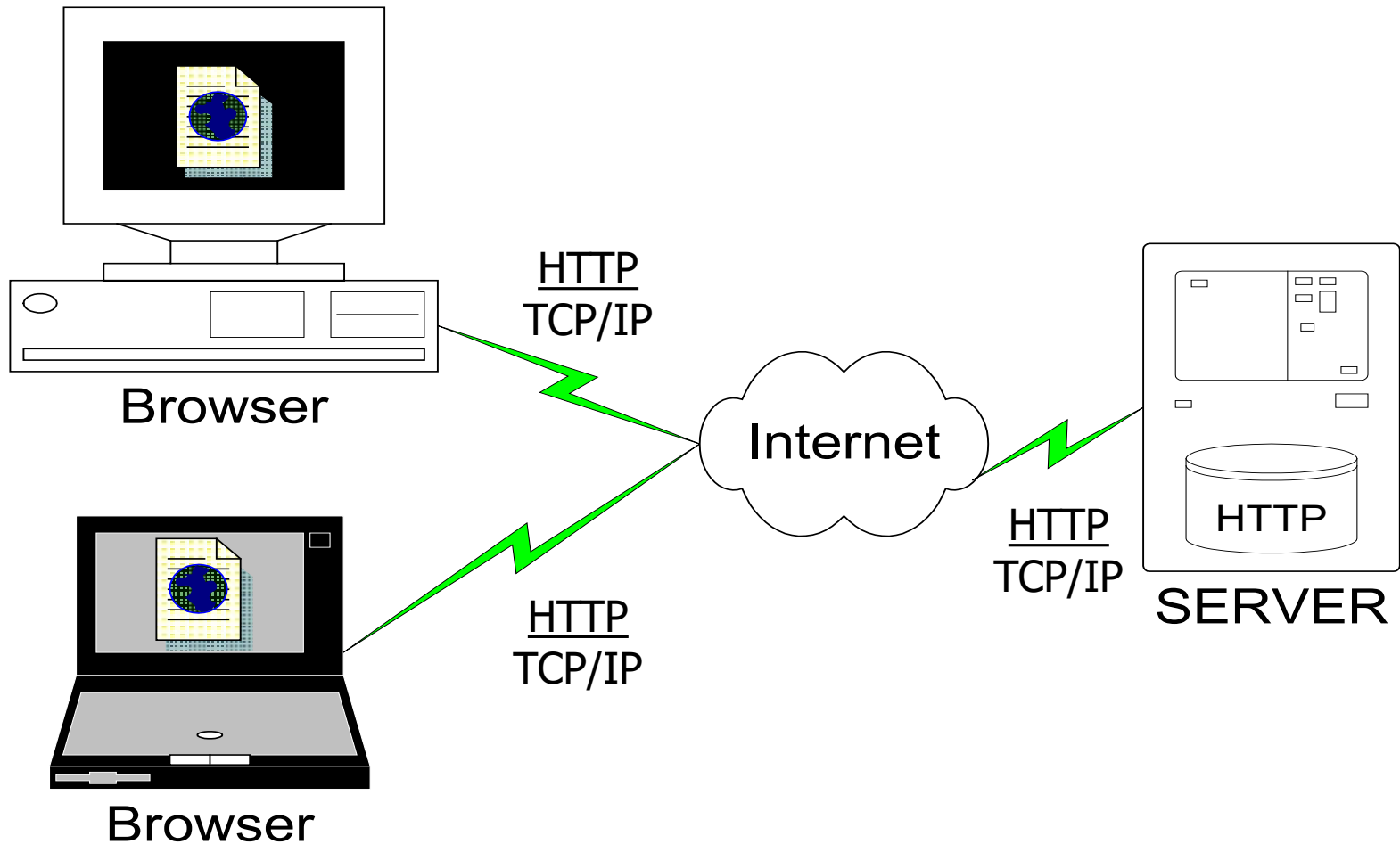
- To understand the answer, you need to know a bit more about how the web works



HOW THE WEB WORKS

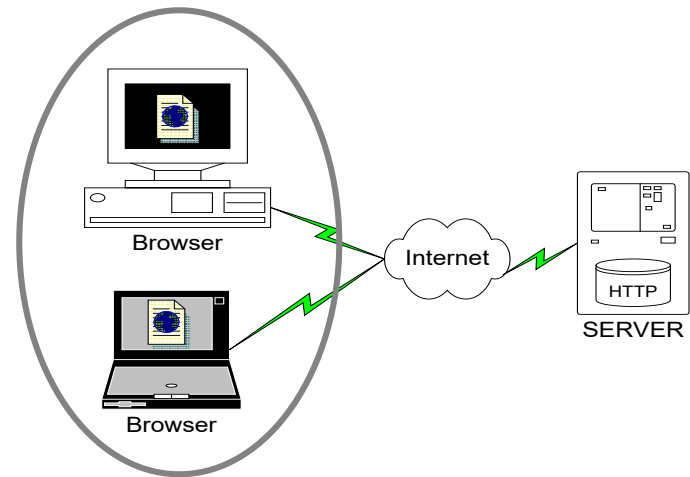


WEB ARCHITECTURE OVERVIEW



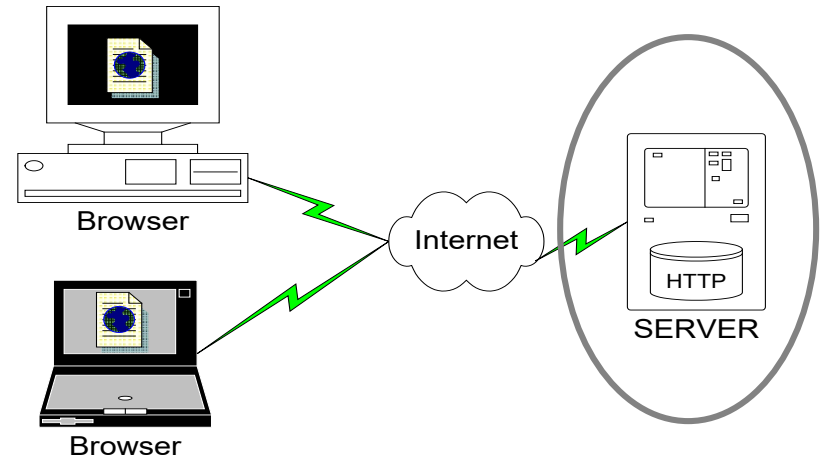
THE CLIENT

- A Client is a device that users can use to submit requests to other computers (Servers).
- A Client can be any device, such as your PC, Mac, tablet, or cell Phone.



THE SERVER

- A Server is a computer that can accept requests from clients and process a response
- There are many kinds of servers:
 - File Servers, Print Servers, Mail Servers, Database Servers, Web Servers....



WEB SOFTWARE COMPONENTS

- The Client Browser

- Chrome, Firefox, Internet Explorer, Safari, Opera, and a host of others.

- The Web Server

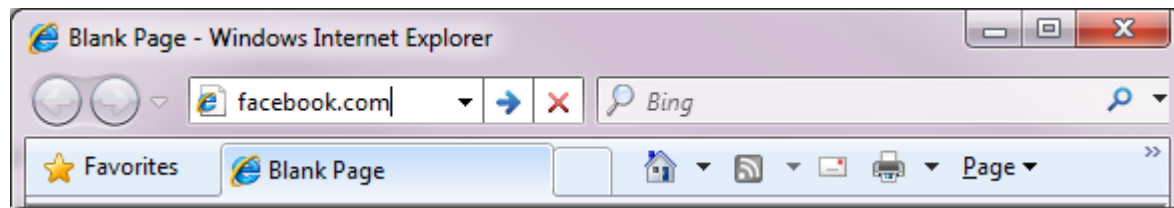
- Apache, Microsoft IIS, nginx, and several others.

HOW DO THE BROWSER AND SERVER REALLY TALK?



WHAT REALLY HAPPENS WHEN YOU NAVIGATE TO A URL?

- You type an **URL** (Uniform Resource Locator, e.g., www.facebook.com) into the browser or click on a link.

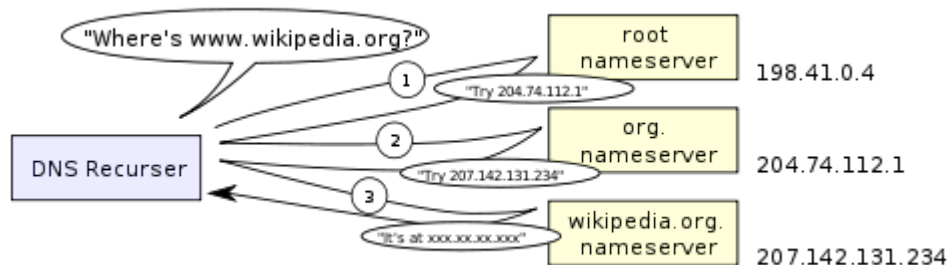


- Either way, the browser sends a request to the IP address specified in the URL.
- The request goes to the local Server (within the company, your service provider (ISP), or the Internet).
- A translator, **DNS** (Domain Name Service/System), translates the URL to an IP Address.



WHAT REALLY HAPPENS WHEN YOU NAVIGATE TO A URL? (CONT.)

- The Server determines that the address (in this case, Facebook) is outside somewhere and forwards the request to the Internet – together with the return address (your computer or client)
- The Internet has a number of machines (computers) called Routers. The router, routes the request to its destination. It may go through several routers before it gets to its destination (in this case, Facebook's Web Server).



- Try to type `tracert www.facebook.com` in Command Prompt in your laptop and see what happens.

WHAT REALLY HAPPENS WHEN YOU NAVIGATE TO A URL? (CONT.)

- The browser sends a HTTP request to the web server.



- Facebook's server then tries to locate the specific page (specified in the URL) that you requested. Sometimes this is the home page – it could also be some specific page within Facebook's web site.



- The resource (the requested page) is then sent back. It goes through several routers on the Internet and eventually gets to the local server (in this case, Babson's Web Server).



WHAT REALLY HAPPENS WHEN YOU NAVIGATE TO A URL? (CONT.)

- This server determines the IP Address to which the resource must be sent (the IP address of your computer).
- Your browser receives the resource. The resource is coded in HTML. The browser interprets the HTML.
- The browser also determines if additional resources are needed to display the page (e.g., images, multi-media, etc.) and sends additional requests for each resource needed.



- Once the browser has all the resources, it interprets the HTML-coded resource and displays the page on your client computer.

ESTABLISHING A SESSION

- What is a session?
 - An extended interaction between a client and a server
- Why are sessions valuable?
- The problem:
 - HTTP is "stateless". Each client file request/server response is treated independently

ESTABLISHING A SESSION

■ Cookie

- A small file written by your web browser at the direction of the HTML page you receive
- The browser viewing a page at one domain can read all the cookies written by (only) that browser when previously viewing a page on that domain



■ Query string

- Text written after a question mark in the URL
- Let's look at an example

GOOGLE SEARCH

- When I search for *something*
 - <https://www.google.com/search?q=babson>
 - <https://www.google.com/search?q=recursion>

GOOGLE SEARCH

- If I search for 'Boston Red Sox', the first link looks like this:

Official Boston Red Sox Website | MLB.com

boston.redsox.mlb.com/ ▼ Boston Red Sox ▼

The official website of the **Boston Red Sox** with the most up-to-date information on scores, schedule, stats, tickets, and team news.

- But if right-click on the link , Copy Link Location, and paste it into a document, this is what I get:

- <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=4&cad=rja&uact=8&ved=0ahUKEwiVkJvPAhUGPz4KHaj7B48QFggMAM&url=http%3A%2F%2Fboston.redsox.mlb.com%2F&usg=AFQjCNEEetooKfg2x8QiKRPgFxrIPpnlw&sig2=BFD4lviUEOIEQAglR5TZJw>



HOW CAN YOU ANALYZE THE
TRAFFIC AT YOUR SERVER?



COLLECTING THE DATA

- Data is collected automatically by the server in a log file
- Code can be placed on a web page to report visits to that page to an analysis service, such as Google Analytics



SERVER LOG ANALYSIS



WHAT DOES THE SERVER LOG?

- Data from each http request/response pair
- From the http header
 - IP address of the client
 - URL of the referrer
- From the URL
 - File served
 - Query string
- Date/Time

A WEB SERVER LOG EXAMPLE

```
fcrawler.looksmart.com - - [26/Apr/2000:00:00:12 -0400] "GET /contacts.html HTTP/1.0" 200 4595 "-" "FAST-WebCrawler/2.1-pre2 (ashen@looksmart.net)"
fcrawler.looksmart.com - - [26/Apr/2000:00:17:19 -0400] "GET /news/news.html HTTP/1.0" 200 16716 "-" "FAST-WebCrawler/2.1-pre2 (ashen@looksmart.net)"

ppp931.on.bellglobal.com - - [26/Apr/2000:00:16:12 -0400] "GET /download/windows/asctab31.zip HTTP/1.0" 200 1540096 "http://www.htmlgoodies.com/download

123.123.123.123 - - [26/Apr/2000:00:23:48 -0400] "GET /pics/wpaper.gif HTTP/1.0" 200 6248 "http://www.jafsoft.com/asctortf/" "Mozilla/4.05 (Macintosh; I
123.123.123.123 - - [26/Apr/2000:00:23:47 -0400] "GET /asctortf/ HTTP/1.0" 200 8130 "http://search.netscape.com/Computers/Data Formats/Document/Text/RTF
123.123.123.123 - - [26/Apr/2000:00:23:48 -0400] "GET /pics/5star2000.gif HTTP/1.0" 200 4005 "http://www.jafsoft.com/asctortf/" "Mozilla/4.05 (Macintosh
123.123.123.123 - - [26/Apr/2000:00:23:50 -0400] "GET /pics/5star.gif HTTP/1.0" 200 1031 "http://www.jafsoft.com/asctortf/" "Mozilla/4.05 (Macintosh; I;
123.123.123.123 - - [26/Apr/2000:00:23:51 -0400] "GET /pics/a2hlogo.jpg HTTP/1.0" 200 4282 "http://www.jafsoft.com/asctortf/" "Mozilla/4.05 (Macintosh;
123.123.123.123 - - [26/Apr/2000:00:23:51 -0400] "GET /cgi-bin/newcount?jafsof3&width=4&font=digital&noshw HTTP/1.0" 200 36 "http://www.jafsoft.com/asc
```

Source: http://www.jafsoft.com/searchengines/log_sample.html

THREE VISITORS

```
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123.123.123.123 - - [26/Apr/2000:00:23:51 -0400] "GET /cgi-bin/newcount?jafsof3&width=4&font=digital&noshw HTTP/1.0" 200 36 "http://www.jafsoft.com/asc
```

- I. A visit from the "FAST-WebCrawler" web spider from the www.looksmart.com site. This retrieved Jasoft's contacts and news pages, and presumably (re-)indexed them for their search engine.

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```
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```

2. Someone using the bellglobal.com ISP to download Jasoft's AscToTab program in a .zip file. This person came from the www.htmlgoodies.com website.

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123.123.123.123 - - [26/Apr/2000:00:23:51 -0400] "GET /cgi-bin/newcount?jafsof3&width=4&font=digital&noshw HTTP/1.0" 200 36 "http://www.jafsoft.com/asct
```

- Someone from IP address 123.123.123.123 (changed to protect identity) who looked at Jasoft's AscToRTF - text to RTF converter homepage. This person came from the web directory at Netscape's site, and was using a Macintosh.

SERVER REQUESTS

```
fcrawler.looksmart.com - - [26/Apr/2000:00:00:12 -0400] "GET /contacts.html HTTP/1.0" 200 4595 "-" "FAST-WebCrawler/2.1-pre2 (ashen@looksmart.net)"
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```

1. Web page at /asctortf, which generated at least five other requests:
2. Three .gif files
3. One .jpg file
4. One call to program called newcount
5. Calls to files at other servers are not logged at this server

TIME STAMP

```
fcrawler.looksmart.com - - [26/Apr/2000:00:00:12 -0400] "GET /contacts.html HTTP/1.0" 200 4595 "-" "FAST-WebCrawler/2.1-pre2 (ashen@looksmart.net)"
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```

- Time stamp documents time of request but is entered when request is satisfied, so it might seem out of order
- Although in this case the three visitors didn't overlap in the log file, in general this wouldn't be the case.

LOGIN INFO

```
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```

- If user had to log in, this field would contain user-id and perhaps password

GET VS. POST

```
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```

- If the user had submitted a form, the http type would be POST rather than GET and the data from the form would follow. The request would be to a program that typically generates a database entry and processes a transaction.



WEB ANALYTICS 2.0

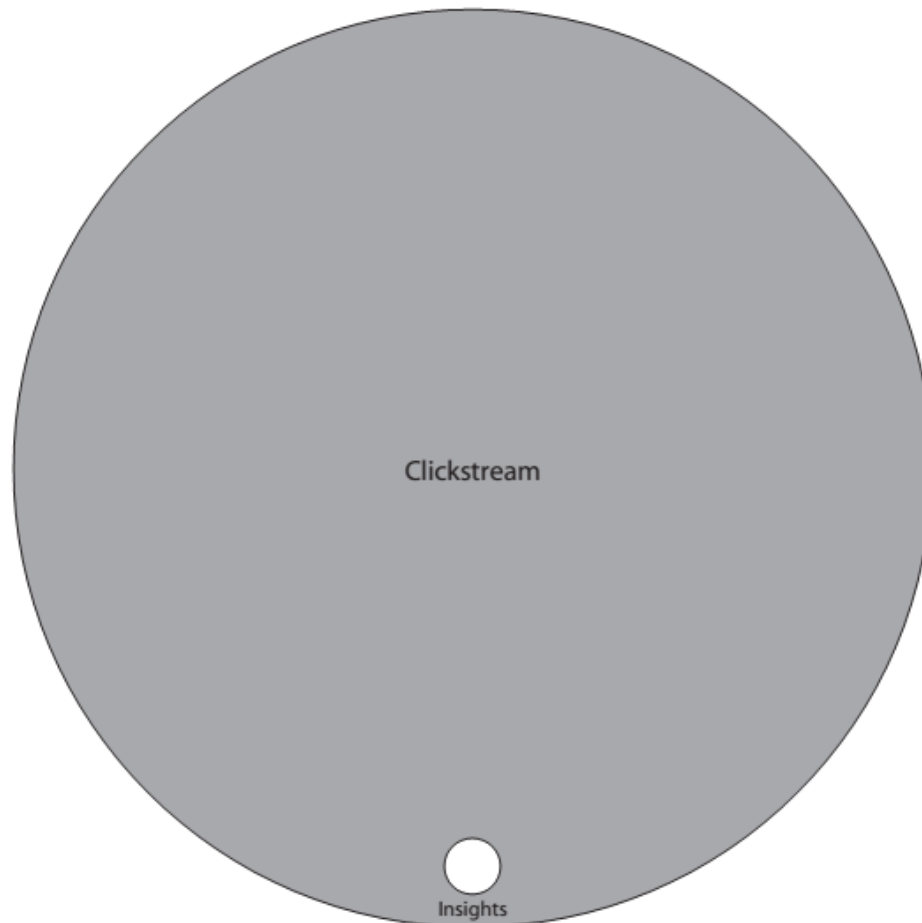


WEB ANALYTICS 2.0 - DEFINITION

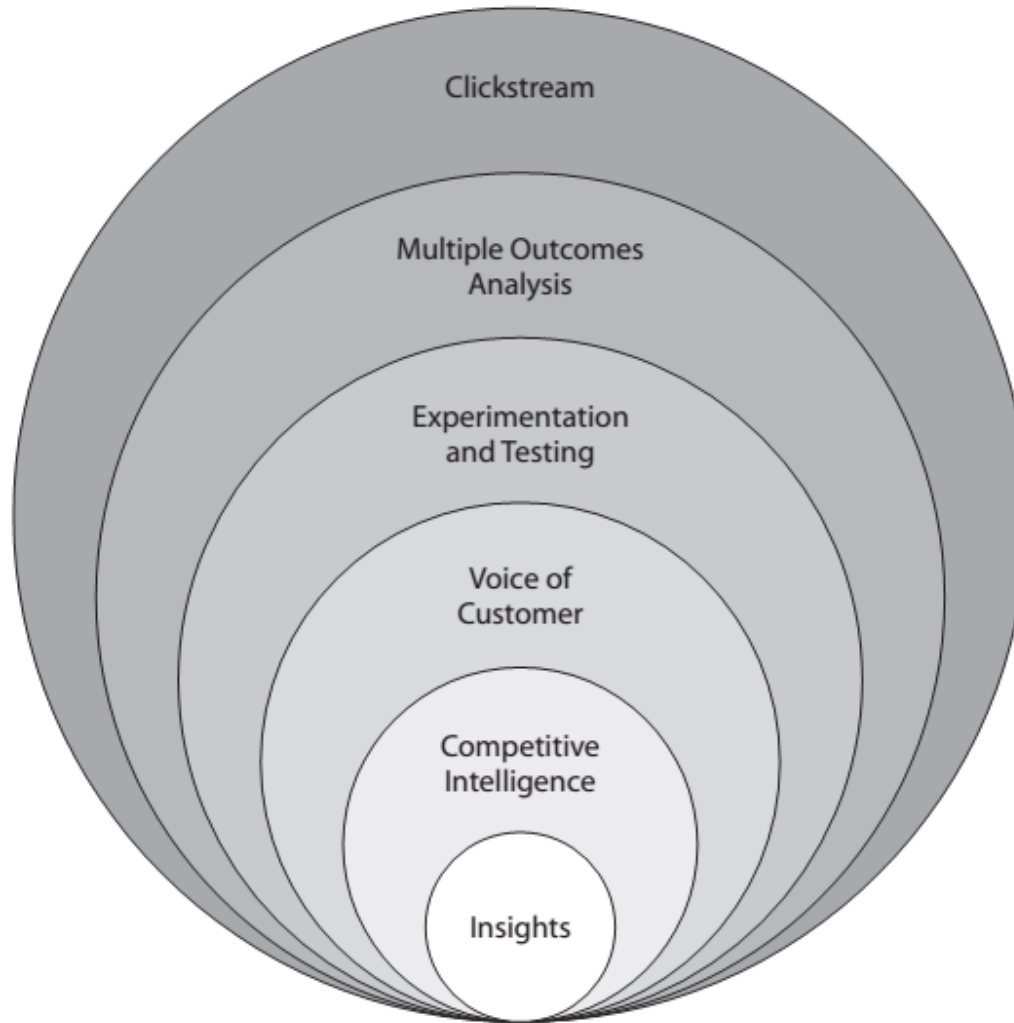
1. The analysis of **qualitative** and **quantitative** data from your website and the **competition**,
2. to drive a **continual improvement** of the **online experience** that your **customers**, and **potential customers** have,
3. which **translates** into your **desired outcomes** (online and offline).

<http://www.kaushik.net/avinash/rethink-web-analytics-introducing-web-analytics-20>

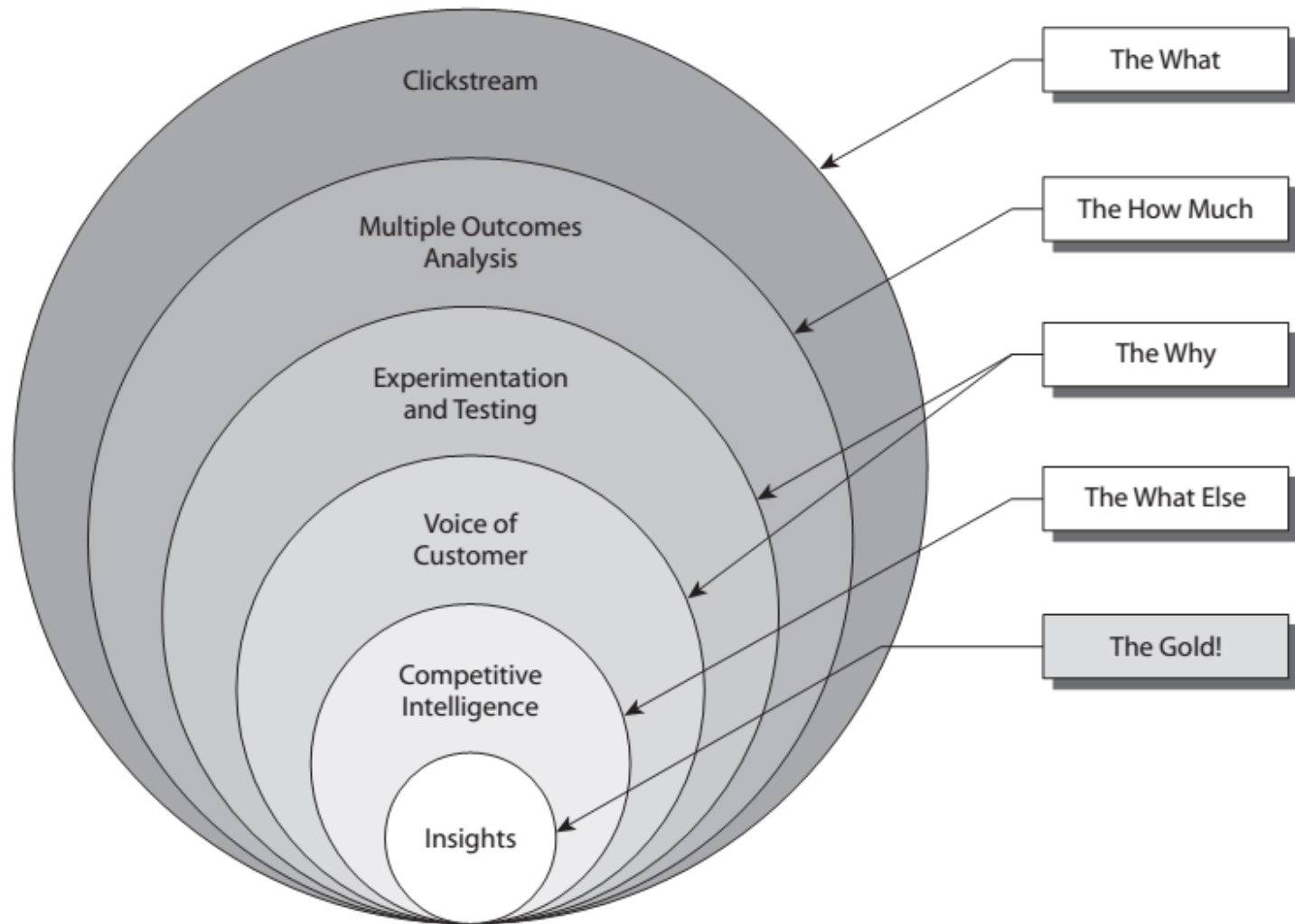
THE OLD PARADIGM OF WEB ANALYTICS 1.0



UPDATED PARADIGM OF WEB ANALYTICS 2.0



KEY QUESTIONS ASSOCIATED WITH WEB ANALYTICS 2.0



CLICKSTREAM

■ Tools

■ in house:

- collecting, storing, processing, analyzing

■ out:

- collecting and analyzing

MULTIPLE OUTCOMES ANALYSIS

- A website attempts to deliver just three types of outcomes:
 - Increase revenue
 - Reduce cost
 - Improve customer satisfaction/loyalty

EXPERIMENTATION AND ANALYSIS (THE WHY)

- Testing
- Trying
- Experimentation
- https://support.google.com/analytics/topic/1745146?hl=en&ref_topic=1120718

VOICE OF CUSTOMER

- Surveys
- Lab usability testing
- Remote usability testing
- Card sorting
 - <https://www.optimalworkshop.com/optimalsort>

THE WHAT ELSE: COMPETITIVE INTELLIGENCE

- Information about direct and indirect competitors
 - <http://www.alex.com>
 - <https://www.google.com/trends/>
 - <https://archive.org/>
- Your performance against competitors

THE 10/90 RULE

- *“If you have a budget of \$100 to make smart decisions about your websites ... invest \$10 in tools and vendor implementation and spend \$90 on Analysts with big brains.”*

WHY 10/90?

- Websites are massively complex
- Tools are only about the data
- Complex world
- Tribal knowledge (unwritten rules, missing metadata, actions of random people,...)

SOME DEFINITIONS

■ Page

- A page is an analyst-definable unit of content.

■ Pageviews

- The number of times a page (an analyst-definable unit of content) was viewed.

■ Visit/Sessions

- A visit is an interaction, by an individual, with a website consisting of one or more requests for an analyst-definable unit of content (i.e. “page view”). If an individual has not taken another action (typically additional page views) on the site within a specified time period, the visit session will terminate.
- Visit → Several pageviews: representation of the interaction of the visitor with the site

VISIT CHARACTERIZATION

■ Entry Page

- The first page of a visit.

■ Landing Page

- A page intended to identify the beginning of the user experience resulting from a defined marketing effort.
- Landing pages are often optimized for specific keywords, audiences, or calls to action

■ Exit Page

- The last page on a site accessed during a visit, signifying the end of a visit/session.

■ Visit Duration

- The length of time in a session.

■ Page Views per Visit

VISIT CHARACTERIZATION - REFERRER

■ Referrer

- The referrer is the page URL that originally generated the request for the current page view or object.
- Internal Referrer
- External Referrer
- Search Referrer
- Visit Referrer (session)
- Original Referrer (all visits)

VISIT CHARACTERIZATION - CLICK-THROUGH

■ Click-through

- Number of times a link was clicked by a visitor.
- typically associated with advertising activities, whether external or internal to the site.

■ Click-through Rate/Ratio

- The number of click-throughs for a specific link divided by the number of times that link was viewed.

CONTENT CHARACTERIZATION

- Single-Page Visits

- Visits that consist of one page regardless of the number of times the page was viewed.

- Single Page View Visits (Bounces)

- Visits that consist of one page-view

- Bounce Rate

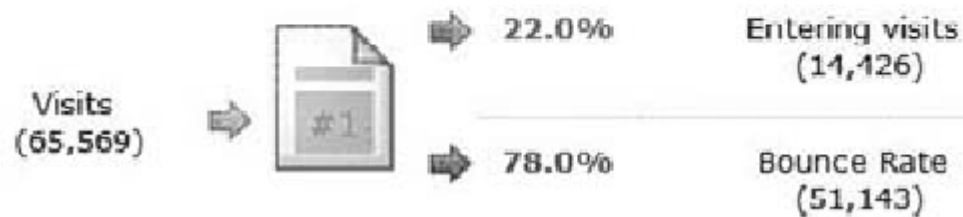
- “I came, I puked, I left.”
 - the percentage of sessions on your website with only one page view

- Conversion

- A visitor completing a target action.

EXAMPLE OF BOUNCE RATE

Traffic	P	P - 1	P - 2
Page views	98,336	+343%	(-)
Visits	65,569	+363%	(-)
Total visitors	59,886	+368%	(-)



EXIT RATE VS. BOUNCE RATE

- What is the Exit rate for each page? What is the Bounce rate?
 - **Monday:** Page B > Page A > Page C > Exit
 - **Tuesday:** Page B > Exit
 - **Wednesday:** Page A > Page C > Page B > Exit
 - **Thursday:** Page C > Exit
 - **Friday:** Page B > Page C > Page A > Exit

SOME QUESTIONS

- How many Visitors are coming to my website?
 - Long-term focus, trends,...
- Where are Visitors coming from?
 - Referring URLs, Search Keywords
- What do I want Visitors to do on the website?
 - What is it for?
- What are Visitors actually doing?
 - Top entry pages, top viewed pages, Site overlay (click density) analysis, Abandonment analysis.

EXAMPLES OF ACTIONABLE OUTCOME KPIS

- Conversion Rate
- Average Order Value
- Days & Visits To “Purchase”.
- Visitor Loyalty & Visitor Recency.
- Task Completion Rate.
- Share of Search.

SOCIAL, MOBILE, VIDEO. THE DATA CHALLENGE

- Consumption off-site (feed readers, aggregator sites, mobile (apps), ...)
- We need more info! (feed subscribers?)
- From Conversion rate to Conversation rate
- What's special about analyzing mobile data?

BLOGS

- Raw Author Contribution (do I deserve to be successful?)
 - Posts per month
 - Content created
- Audience Growth (Is anyone reading?)
- Conversation rate
- Citation (other pages, Twitter, ...)
- Cost of blogging
- Benefit
 - Comparative value, direct value, nontraditional value, unquantifiable value

TWITTER

- Growth in Number of Followers
- Message Amplification (RT)
- Click Through Rates and Conversions
- Conversation Rate
- Klout score
 - Engagement - Reach - Velocity - Demand - Network Strength - Activity
 - <https://klout.com/corp/score>
- How about Facebook, Instagram, Snapchat...?

VIDEO

- Video consumption (and location)
- Attention and Audience Engagement
- Social Engagement
- Tracking Virality

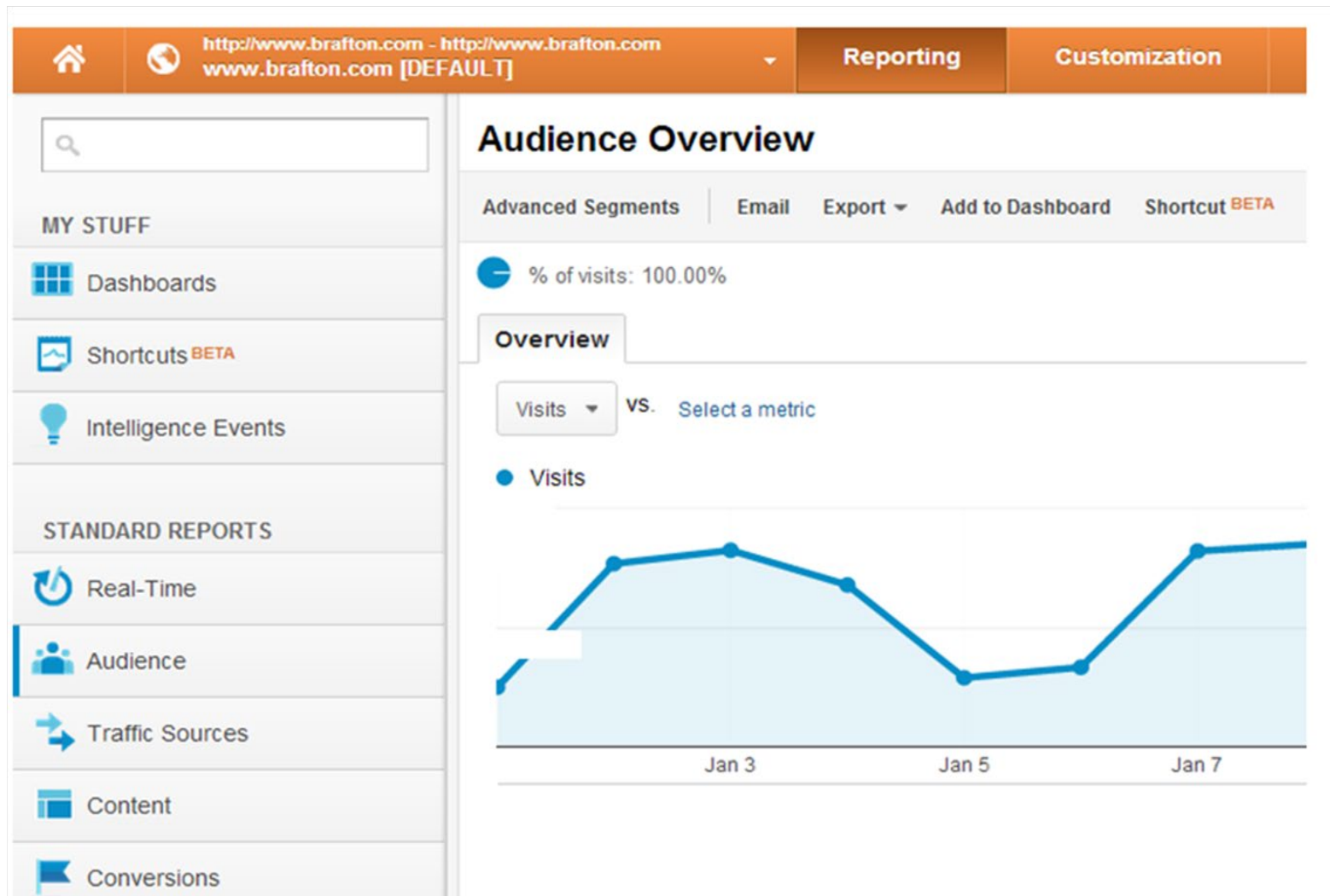


GOOGLE ANALYTICS



CREATING A GOOGLE ANALYTICS ACCOUNT

- Sign into Google (must have a Google account)
- Go to <https://www.google.com/analytics>
- Sign in Google Analytics
- Click the Sign Up button and answer the questions
- Click the "Get Tracking ID" button at the bottom of the page
- Under "Tracking Info" click "Tracking Code"
 - Copy and paste the JavaScript code as the first item into the <HEAD> of every webpage you want to track.



Dashboard

Visitors

Overview

Map Overlay

New vs. Returning

Languages

▶ Visitor Trending

▶ Visitor Loyalty

▶ Browser
Capabilities

▶ Network Properties

User Defined

Traffic Sources

Content

Goals

Settings

Email

Help Resources

? About this Report

? Conversion
University

? Common Questions

? Report Finder

? Beta Feedback

Overview »

New vs. Returning

Apr 1, 2007 - May 1, 2007

Export

Email

Add to Dashboard



17,311 visits from 2 visitor types

Site Usage

Goal Conversion

Views:

Visits ?	Pages/Visit ?	Avg. Time on Site ?	% New Visits ?	Bounce Rate ?
17,311	1.74	00:02:06	65.36%	69.61%
% of Site Total: 100.00%	Site Avg: 1.74 (0.00%)	Site Avg: 00:02:06 (0.00%)	Site Avg: 65.36% (0.00%)	Site Avg: 69.61% (0.00%)

Visitor Type	Visits	Individual Visitor Type:	Visits	compared to site average
New Visitor	11,315			30.73%
Returning Visitor	5,996			-30.73%

Find Visitor Type: Show rows: 1 - 2 of 2

Dashboard

► Saved Reports

Visitors

Traffic Sources

Content

Goals

Settings

Email

Help Resources

- About this Report
- Conversion University
- Common Questions
- Report Finder
- Beta Feedback

Dashboard

Apr 1, 2007 - May 1, 2007

Export

Email



Site Usage



17,311 Visits



30,080 Pageviews



1.74 Pages/Visit



00:02:06 Avg. Time on Site

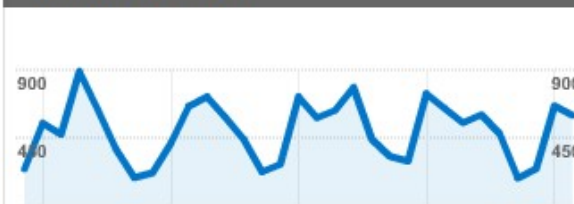


69.61% Bounce Rate



65.36% % New Visits

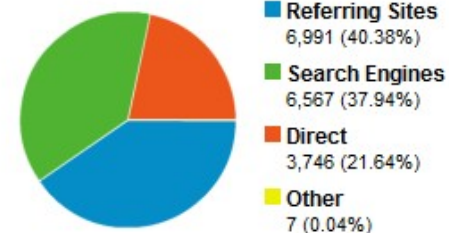
Visitors Overview



12,351 Visitors

[view report](#)

Traffic Sources Overview



[view report](#)

Reports: www.googlestore.com

Dashboards

View [Executive](#)

- Executive Overview
- E-commerce Summary
- Conversion Summary
- Marketing Summary
- Content Summary
- Site Overlay

All Reports

- Marketing Optimisation
- Content Optimisation
- E-Commerce Analysis

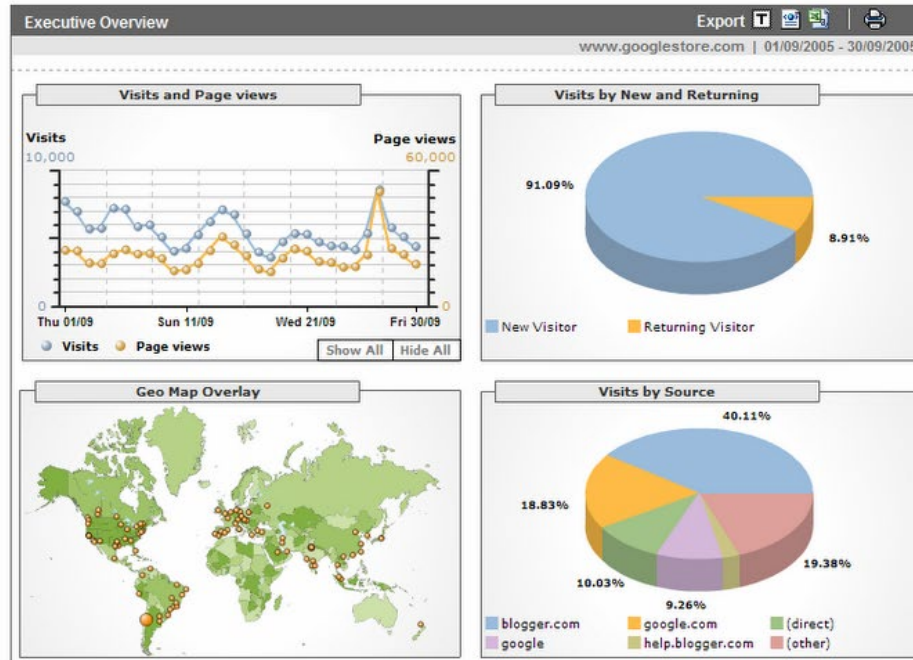
Date Range ?

View By [Default](#)

◀ 2005 ▶

Jan	Feb	Mar	Apr	May	Jun
Jul	Aug	Sep	Oct	Nov	Dec
S	M	T	W	T	F
→ 28	29	30	31	1	2
→ 4	5	6	7	8	9
→ 11	12	13	14	15	16
→ 18	19	20	21	22	23
→ 25	26	27	28	29	30
1					

Prev << Month >> Next



Help Information

Visitor Summary

The four graphics in this report provide a quick snapshot of visits to your site. The following are shown:

- ♦ the total number of visits and page views your site received, the average number of page views per visit (PV) and the number of visits and page views over time. Averages are calculated over the entire selected date range including dates not yet elapsed when applicable.
- ♦ the number of first-time visits and returning visits
- ♦ the cities from which the most visitors come to your site
- ♦ your top referral sources.

SEGMENTS IN GOOGLE ANALYTICS

- Allow you to understand your visitors better by grouping them based on selected characteristics
- Rather than an average over all groups, you can then get data for each group
 - Why averages are so often misleading

Out of a total of **9,551** visits...

Test Segment

delete

Medium	Condition Matches exactly ▾ <input type="checkbox"/> case sensitive	Value organic ▾	→ 2,518 visits	✕
or				
Add "or" statement				
and				
Keyword	Condition Does not contain ▾ <input type="checkbox"/> case sensitive	Value mydomain ▾	→ 8,722 visits	✕
or				
Add "or" statement				
and				
Add "and" statement				

...this segment matches **1,689** visits

Test Segment

GOALS/CONVERSIONS IN ANALYTICS

- Should be tied to revenue generation or revenue potential
- Examples:
 - Orders placed (number or \$)
 - Opt ins for email
 - White paper download

My Dashboard

22 May 2012 - 21 Jun 2012

+ Add Widget | Share Dashboard | Email **BETA** | Export

Delete Dashboard

Visits

● Visits

50



Avg. Visit Duration

● Avg. Visit Duration

00:08:20

00:04:10



Goal Conversion Rate

● Goal Conversion Rate

40%



Visits by Traffic Type



■ 56.68% organic

356 Visits

■ 23.88% referral

150 Visits

■ 19.44% Other

122 Visits

Pageviews by Traffic Type



Visits and Pageviews by Mobile

Mobile	Visits	Pageviews
No	561	1,720
Yes	67	162

Visits and Avg. Visit Duration by Country/Territory

Country/Territory	Visits	Avg. Visit Duration
United Kingdom	280	00:02:52
United States	110	00:00:59
India	43	00:00:39
Canada	26	00:01:04
France	17	00:00:01

Visits and Pages / Visit by Country/Territory

Country/Territory	Visits	Pages / Visit
United Kingdom	280	3.40

Goal Conversion Rate

16.24%

Site Avg: 16.24% (0.00%)

Goal Completions

102

% of Total: 100.00% (102)

Goal Value

£182.00

% of Total: 100.00% (£182.00)

Goal Completions and Goal Conversion Rate

Source	Goal Completions	Goal Conversion Rate
google	57	16.52%
(direct)	18	16.07%
t.co	10	28.57%
linkedin.com	5	13.51%
facebook.co		

SOME DRAWBACKS TO GOOGLE ANALYTICS

■ Data Limits

- Standard (free) account limit is 10 million hits per month, Premium account is 1 billion hits per month.

■ Premium Service Pricing

- \$150,000 annual flat fee is a steep price to pay; some users prefer a cheaper option.

■ Data Collection and Reporting Delays

- Google shows real time data of site visitors, referral websites, and geographical data. The collection and reporting system has a delay of 24 hours for Standard users and 4 hours for Premium users for data such as conversions.

ALTERNATIVES TO GOOGLE ANALYTICS

- Log file analysis software, such as WebLog Expert, Event Tracker, AWStats, or more generic analysis tools such as Tableau or Splunk
- Tools that operate in a similar fashion to Google Analytics. See:
 - <http://www.onextrapixel.com/2013/07/16/ten-best-alternatives-to-google-analytics/> or
 - <http://www.pcworld.com/article/2051368/4-simpler-alternatives-to-google-analytics.html>