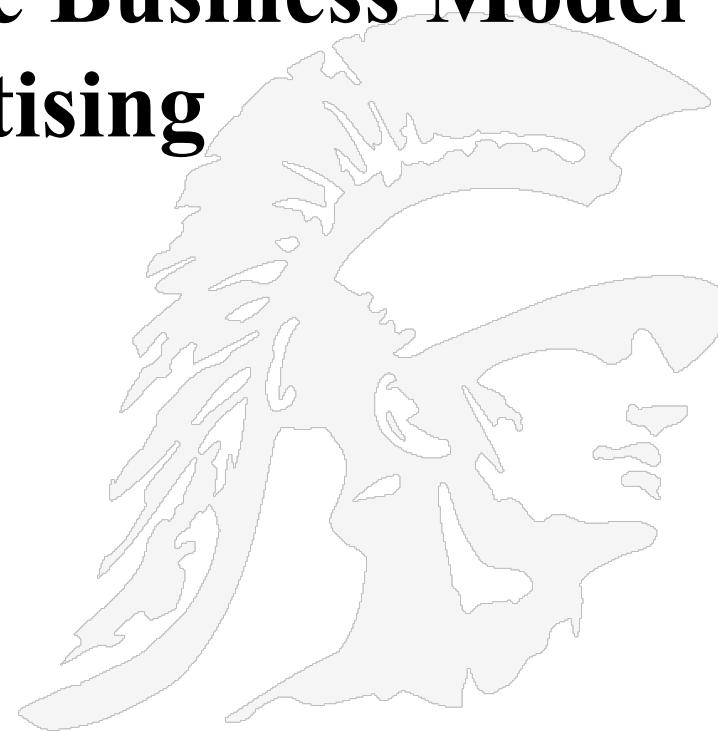
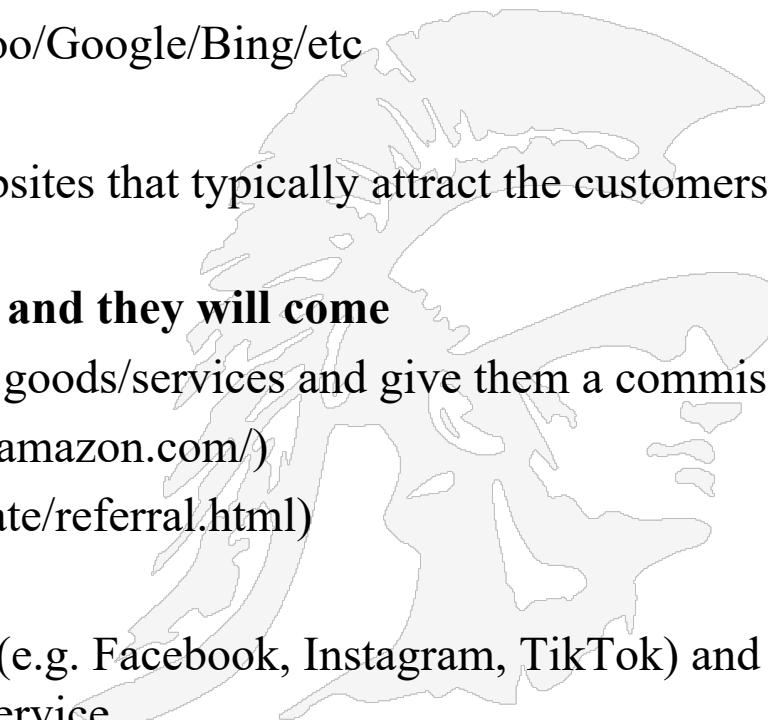


# The Search Engine Business Model Advertising



# Types of Online Advertising

- **Banner Advertising**
  - The earliest form of online ads
  - People have developed “banner blindness”
- **Pay-per-click Advertising**
  - Introduced by search engines Yahoo/Google/Bing/etc
- **Website Advertising**
  - Place ads on blogs/newsletters/websites that typically attract the customers you are aiming at
- **Affiliate Marketing/build a platform and they will come**
  - Let third party sites advertise your goods/services and give them a commission
  - Amazon (<https://affiliate-program.amazon.com/>)
  - Ebay (<http://pages.ebay.com/affiliate/referral.html>)
- **Social Media Marketing**
  - The use of social media platforms (e.g. Facebook, Instagram, TikTok) and websites to promote a product or service



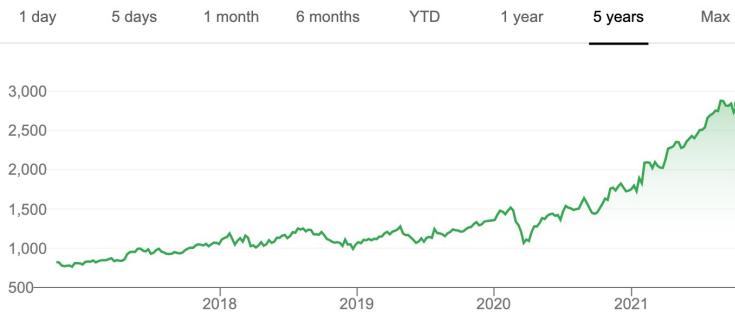
# How Big is Search Engine Advertising

Market Summary > Alphabet Inc Class A

NASDAQ: GOOGL

**2,827.36** USD +2,003.30 (243.10%) ↑ past 5 years

Closed: Oct 15, 6:58 PM EDT · Disclaimer  
After hours 2,827.99 +0.63 (0.02%)

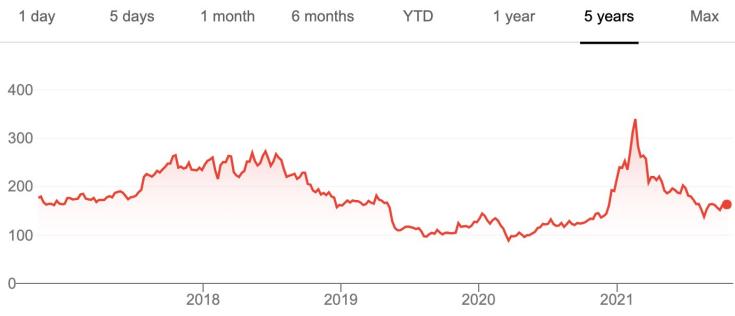


Market Summary > Baidu Inc

NASDAQ: BIDU

**163.63** USD -13.13 (-7.43%) ↓ past 5 years

Closed: Oct 15, 7:59 PM EDT · Disclaimer  
After hours 163.64 +0.0100 (0.0061%)



**Google/Alphabet** earned more than \$257 billion in 2021

**Alibaba** earned \$109 billion in 2021

**Yahoo** earned \$4.6 billion in 2019

(Verizon has purchased Yahoo for \$4.5 billion in 2015)

**Bing**, a division of Microsoft earned \$7.7 billion in 2021

**Baidu** earned \$5.9 billion in 2021

**Google and Baidu Stock History**



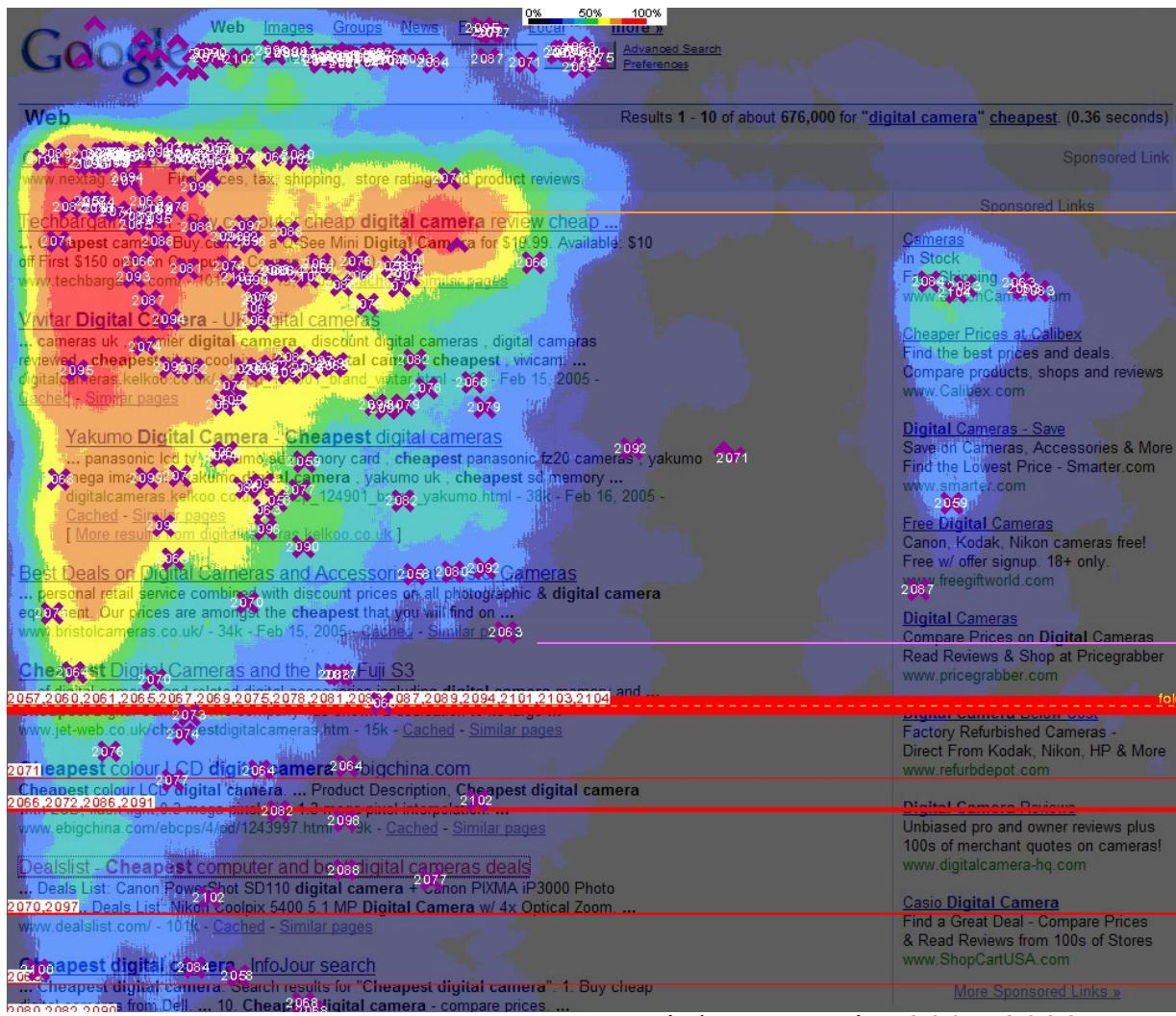
# **Positional Bias is Very Strong**

A google result page showing where people looked and where people clicked

# Eye pupil hotspots

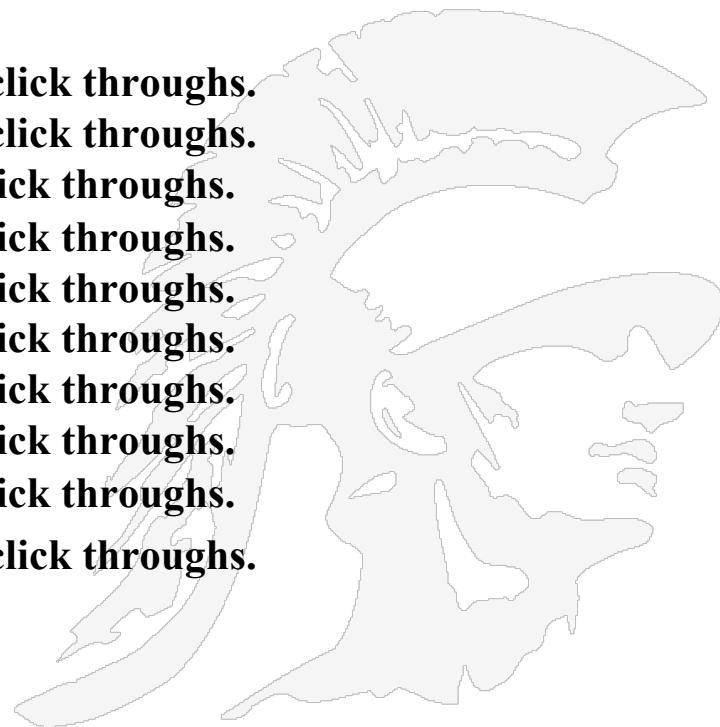
See  
<http://www.entertop.net/>

X marks  
the clicks



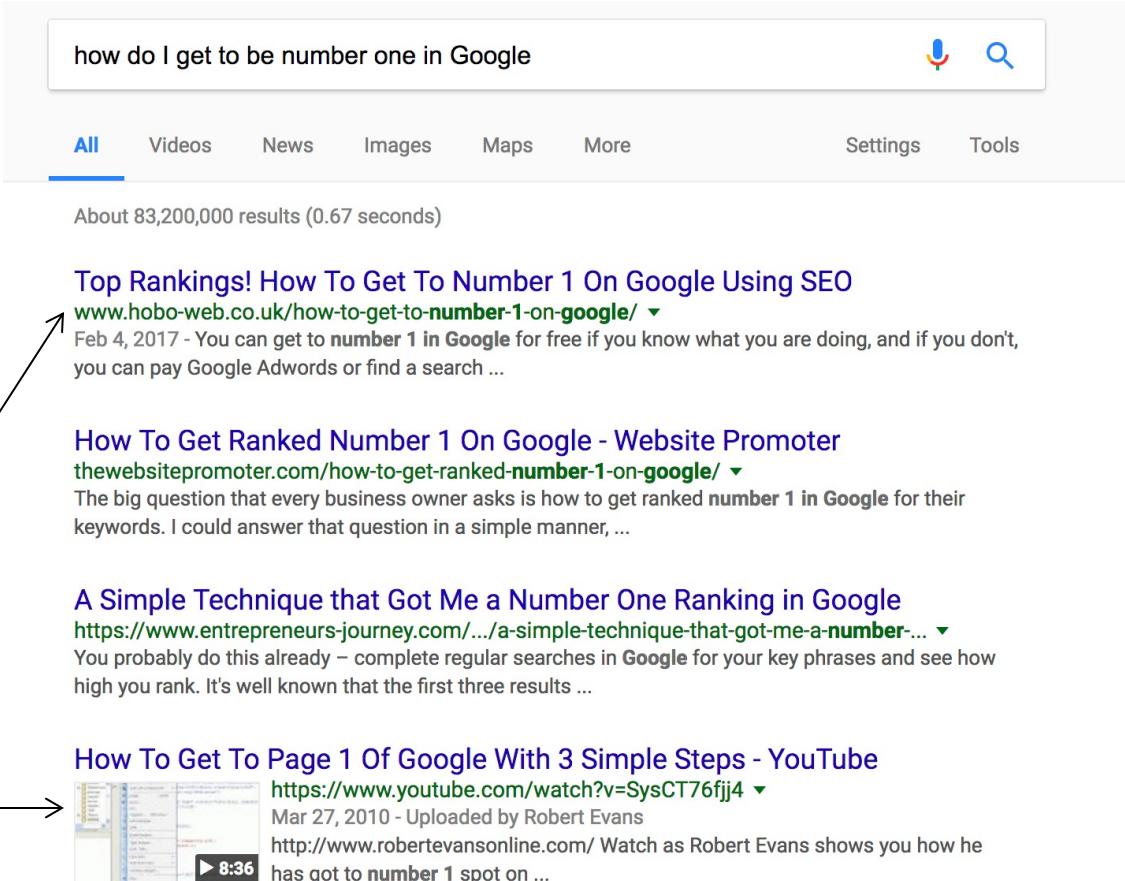
# Estimating the Value of Rank in a Sponsored List

- A survey worked by examining click data from AOL, HitWise and Overture yielding statistics about how often a user clicked on the first search result, second search result, etc.
- Total Searches: 9,038,794
- Total Clicks: 4,926,623
- Ranking Number 1 receives 42.1 percent of click throughs.  
Ranking Number 2 receives 11.9 percent of click throughs.  
Ranking Number 3 receives 8.5 percent of click throughs.  
Ranking Number 4 receives 6.1 percent of click throughs.  
Ranking Number 5 receives 4.9 percent of click throughs.  
Ranking Number 6 receives 4.1 percent of click throughs.  
Ranking Number 7 receives 3.4 percent of click throughs.  
Ranking Number 8 receives 3.0 percent of click throughs.  
Ranking Number 9 receives 2.8 percent of click throughs.
- Ranking Number 10 receives 3.0 percent of click throughs.



# THE MILLION DOLLAR QUESTION

Q. How do I get to number one in Google search results?



how do I get to be number one in Google

All Videos News Images Maps More Settings Tools

About 83,200,000 results (0.67 seconds)

**Top Rankings! How To Get To Number 1 On Google Using SEO**  
[www.hobo-web.co.uk/how-to-get-to-number-1-on-google/](http://www.hobo-web.co.uk/how-to-get-to-number-1-on-google/) ▾  
Feb 4, 2017 - You can get to number 1 in Google for free if you know what you are doing, and if you don't, you can pay Google Adwords or find a search ...

**How To Get Ranked Number 1 On Google - Website Promoter**  
[thewebsitepromoter.com/how-to-get-ranked-number-1-on-google/](http://thewebsitepromoter.com/how-to-get-ranked-number-1-on-google/) ▾  
The big question that every business owner asks is how to get ranked number 1 in Google for their keywords. I could answer that question in a simple manner, ...

**A Simple Technique that Got Me a Number One Ranking in Google**  
<https://www.entrepreneurs-journey.com/.../a-simple-technique-that-got-me-a-number-...> ▾  
You probably do this already – complete regular searches in Google for your key phrases and see how high you rank. It's well known that the first three results ...

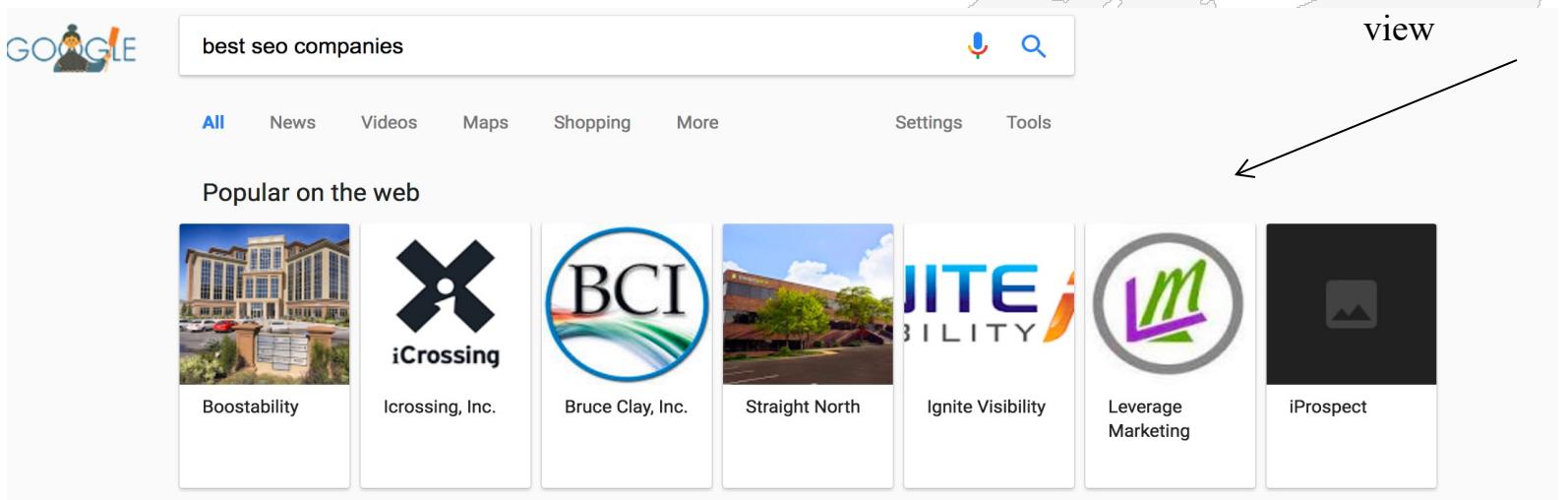
**How To Get To Page 1 Of Google With 3 Simple Steps - YouTube**  
<https://www.youtube.com/watch?v=SysCT76fjj4> ▾  
Mar 27, 2010 - Uploaded by Robert Evans  
http://www.robertevansonline.com/ Watch as Robert Evans shows you how he has got to number 1 spot on ...

Google's organic search results are produced by a proprietary algorithm that is often being changed, so there are never any guarantees that someone will continue to be highly ranked

*But there are lots of people ready to give you advice*

# Search Engine Optimization

- There is an industry of companies whose focus is to develop and refine a company's online presence;
  - They are called Search Engine Optimizers
- **Search Engine Optimization (SEO) involves:**
  - Making pages show up higher in search engine's organic results
  - Optimizing content to target certain keyword phrases
  - Developing web page content that responds to each seeker's interests
- **There are many companies who claim to do SEO**
  - For a list see <http://www.topseos.com/rankings-of-best-seo-companies>
  - Generally they are “small” companies, earning under \$10 million per year



Recent Google horizontal card-style view

The screenshot shows a Google search results page for the query "best seo companies". The results are displayed in a horizontal card-style view, which is highlighted by a callout arrow pointing from the text "Recent Google horizontal card-style view". The cards feature logos and names of various SEO companies: Boostability, iCrossing, Bruce Clay, Inc., Straight North, Ignite Visibility, Leverage Marketing, and iProspect.

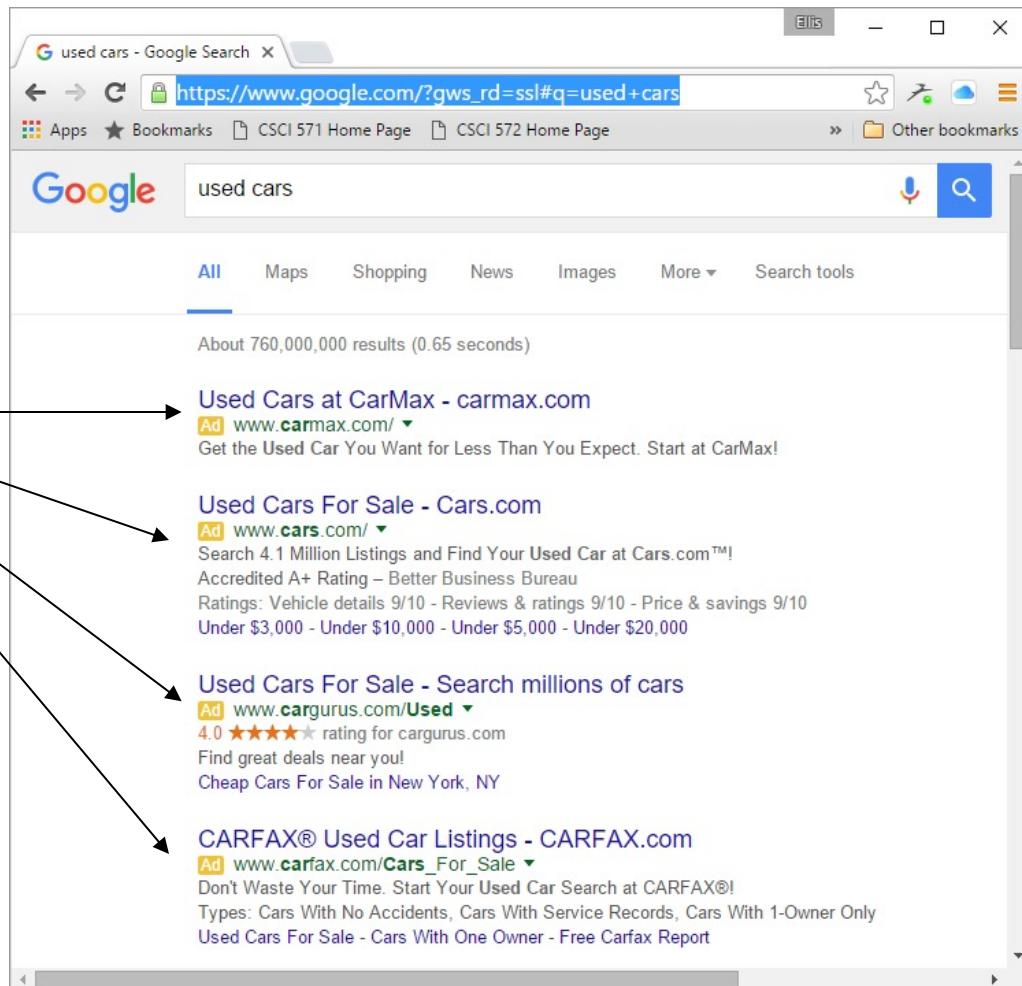
Company	Description
Boostability	Large building image
iCrossing	Stylized 'X' logo
Bruce Clay, Inc.	BCI logo with swoosh
Straight North	Building image
Ignite Visibility	ITE logo with orange swoosh
Leverage Marketing	LM logo in circle
iProspect	Mountain icon in square

# THE MILLION DOLLAR ANSWER

Q. How do I get to number one in Google?  
**A. Use paid search**

Paid search is one answer; Google and many other search engines use the pay-per-click (PPC) model of advertising;

Pay enough for a click and you can pretty much guarantee to get a top spot on the list of ads for your chosen keywords



*Renamed as Google Ads*  
 Google's program for accepting pay-per-click ads.

Its home page is  
<https://ads.google.com>

For every keyword phrase there is an auction where bidders agree to pay a certain amount to Google if their ad is clicked on;

# Lets Take a Close Look at Google Adwords



The screenshot shows the Google AdWords login page. The browser title bar says "Welcome to AdWords - Mozilla Firefox". The address bar shows "https://adwords.google.com/select/Login". The main content area features the Google logo and the heading "Advertise your business on Google". It explains that users can display ads on Google and its network, connect with customers, and only pay when ads are clicked. A call-to-action button "Start now" is visible. On the right, a message indicates that the user is signed in to Google Accounts under a specific email but provides incorrect login credentials. It offers to sign in using the AdWords email and password. Below this, there are fields for "Email" and "Password", a "Sign in" button, and a link "I cannot access my account". At the bottom left, there's a "Learn about AdWords" section with links for "How it works", "Why it works", "Costs and payment", and "For local businesses". The bottom right shows a preview of a Google search results page with an AdWords advertisement highlighted.

# Campaigns Begin By Choosing Keywords

## Google Keyword Estimator

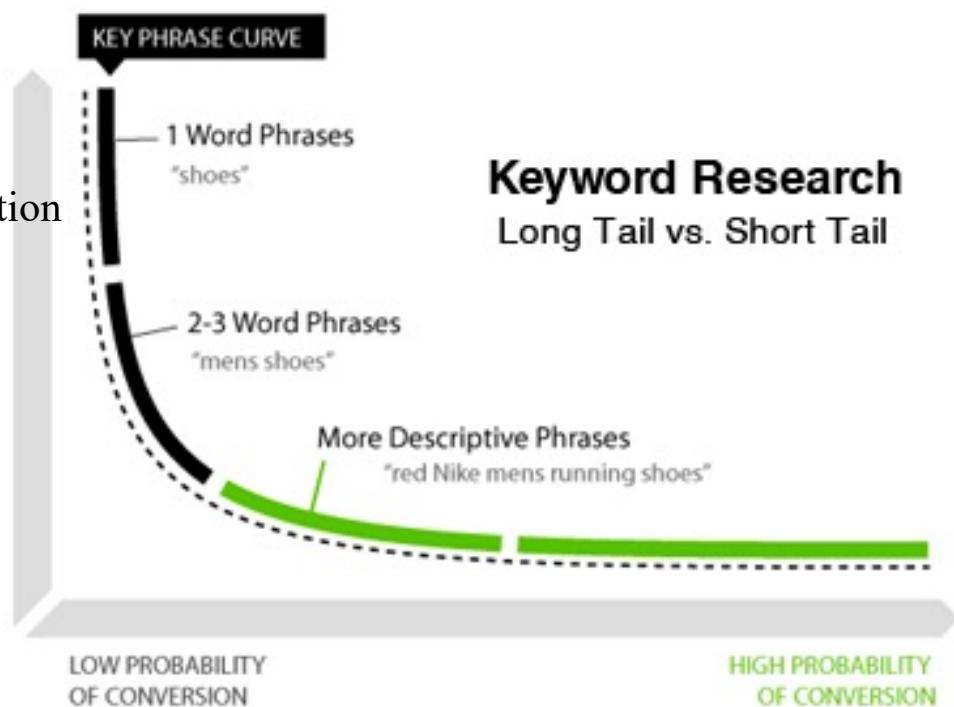
For specific keywords Google provides the approximate cost per click and the resulting position in the list, and other stats

Maximum CPC:	Daily budget:	Get New Estimates			
Keywords ▾	Search Volume	Estimated Avg. CPC	Estimated Ad Positions	Estimated Clicks / Day	Estimated Cost / Day
<b>Search Total</b>		\$5.23 - \$7.34	1 - 3	270 - 348	\$1,450 - \$2,660
crime scene detective class	<div style="width: 10%;">10%</div>		Not enough data to give estimates. <a href="#">[?]</a>		
criminal justice	<div style="width: 20%;">20%</div>	\$4.85 - \$6.84	1 - 3	221 - 277	\$1,080 - \$1,900
criminal justice associates degree	<div style="width: 5%;">5%</div>	\$9.58 - \$12.76	1 - 3	0 - 1	\$0 - \$20
criminal justice career	<div style="width: 5%;">5%</div>	\$3.53 - \$4.41	1 - 3	2 - 3	\$8 - \$20
criminal justice career training	<div style="width: 10%;">10%</div>		Not enough data to give estimates. <a href="#">[?]</a>		
criminal justice classes	<div style="width: 5%;">5%</div>	\$8.72 - \$10.90	1 - 3	0 - 1	\$0 - \$20
criminal justice college	<div style="width: 10%;">10%</div>	\$4.76 - \$5.95	1 - 3	10 - 14	\$50 - \$90
criminal justice course	<div style="width: 5%;">5%</div>	\$10.63 - \$15.94	1 - 3	0 - 1	\$0 - \$20
criminal justice coursework	<div style="width: 10%;">10%</div>		Not enough data to give estimates. <a href="#">[?]</a>		
criminal justice degree	<div style="width: 10%;">10%</div>	\$13.76 - \$20.64	1 - 3	16 - 21	\$230 - \$440
criminal justice online class	<div style="width: 10%;">10%</div>		Not enough data to give estimates. <a href="#">[?]</a>		
criminal justice program	<div style="width: 10%;">10%</div>	\$7.34 - \$9.92	1 - 3	2 - 4	\$20 - \$40
criminal justice school	<div style="width: 10%;">10%</div>	\$7.37 - \$9.31	1 - 3	4 - 6	\$30 - \$60
detective training	<div style="width: 10%;">10%</div>	\$3.58 - \$4.48	1 - 3	2 - 3	\$8 - \$20
law enforcement career	<div style="width: 10%;">10%</div>	\$4.40 - \$5.49	1 - 3	3 - 4	\$20 - \$30
law enforcement program	<div style="width: 10%;">10%</div>	\$3.29 - \$4.12	1 - 3	0 - 1	\$0 - \$5
law enforcement training	<div style="width: 10%;">10%</div>	\$3.44 - \$4.30	1 - 3	10 - 12	\$40 - \$80

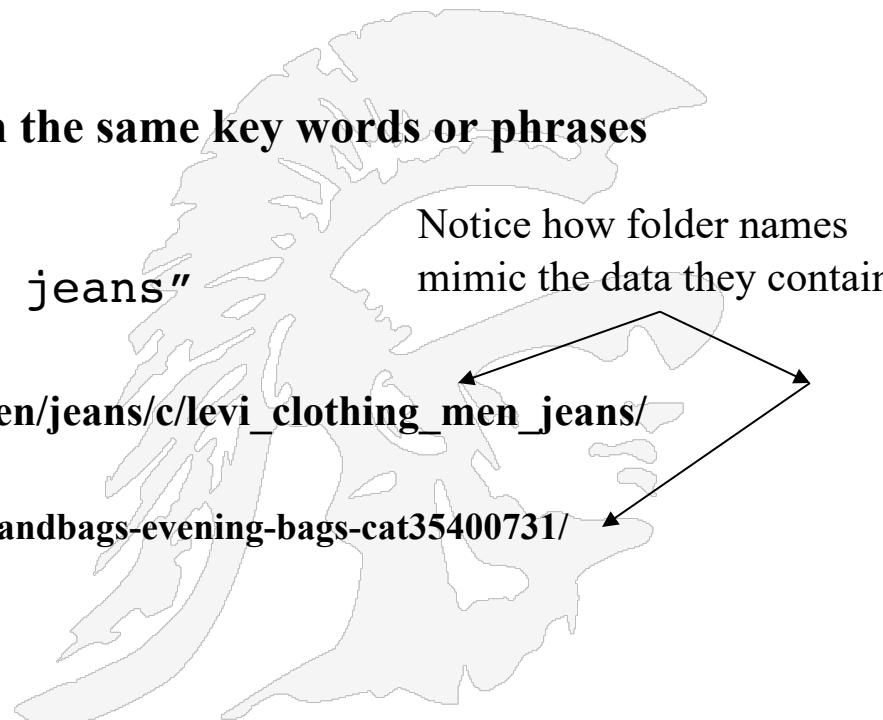
Estimates for these keywords are based on clickthrough rates for current advertisers. Some of the keywords above are subject to review by Google and may not trigger your ads until they are approved. Please note that your traffic estimates assume your keywords are approved.

# Long Tailed Keywords can be Valuable

- Long-tail keywords are search queries made up of three-four word phrases that are very specific to a product, good, or service that's being sold.
  - Long-tail keywords are the phrases search engine users are generally more likely to type in when they're closer to purchasing an item.
- The conversion rate for long-tail keywords is approximately **2.5 times higher than it is for head (shorter) keywords.**
- long-tail keywords that present *less* competition also offer *lower cost-per-click prices* since few marketers are targeting them



# Your Keyword Phrases Should be Mapped on Your Website

- Use key phrases in the content on your page
- Develop metadata that includes key phrases in:
  - TITLE tags
  - Meta Description and Keyword tags
  - ALT tags
- Name directories, files and images with the same key words or phrases
- Query: "Levi's men's clothing jeans" produces the URL  
[https://www.levi.com/US/en\\_US/clothing/men/jeans/c/levi\\_clothing\\_men\\_jeans/](https://www.levi.com/US/en_US/clothing/men/jeans/c/levi_clothing_men_jeans/)
- Query: "Ladies handbags"   
<https://www.neimanmarcus.com/c/handbags-all-handbags-evening-bags-cat35400731/>

Notice how folder names mimic the data they contain

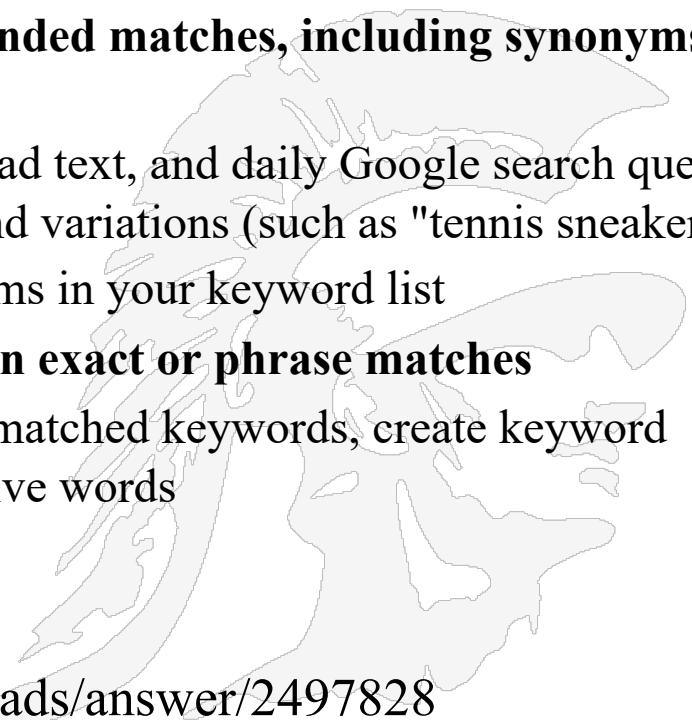
## Advertisers Designate Keyword Matching Rules

- The *advertiser* will specify the type of matching to be done against his keyword phrases
  - Four types of keyword matching options can help you refine your ad targeting
    1. Broad Match
    2. Exact Match
    3. Phrase Match
    4. Negative Keyword



# Keyword: Broad Match

- **A broad match is the default option**
  - When you include keyword phrases like "tennis shoes" in your keyword list, your ads will appear when users search for "tennis" and "shoes", in any order (and possibly along with other terms)
- **Broad Match ads may also show for expanded matches, including synonyms and plurals**
  - Google will analyze your keyword list, ad text, and daily Google search queries, and show your ads for relevant terms and variations (such as "tennis sneakers")
    - Even if you didn't include these terms in your keyword list
- **Broad matches are often less targeted than exact or phrase matches**
  - If you decide to run your ads on broad-matched keywords, create keyword phrases containing at least two descriptive words

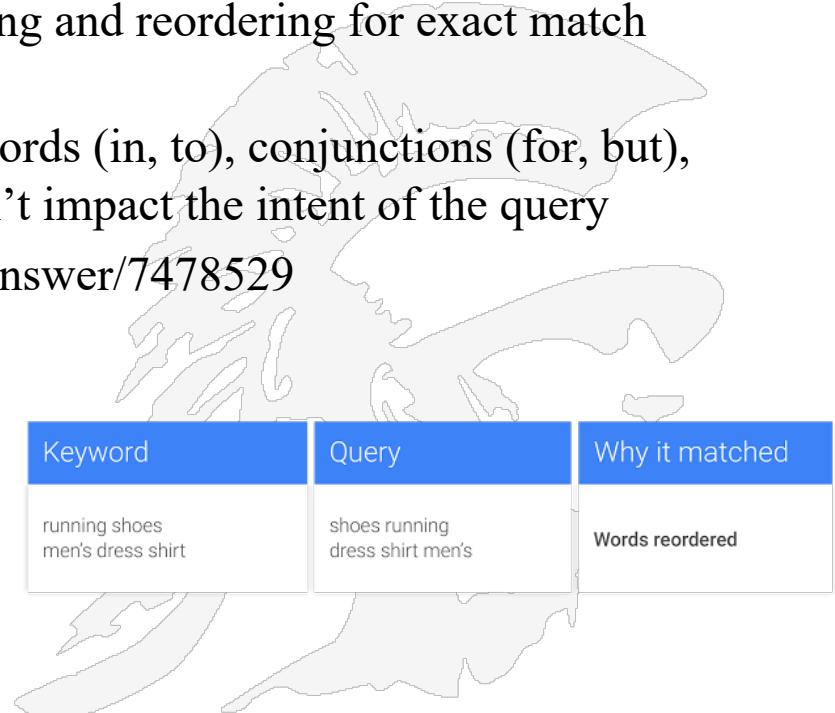


<https://support.google.com/google-ads/answer/2497828>

# Keyword: Exact Match

- The search query must exactly match your keyword
  - Originally Exact Match meant that "tennis shoes" would only match a user request for "tennis shoes" and not for "red tennis shoes," even though the second query contains your keywords
  - However, Google now includes rewording and reordering for exact match keywords
  - Exact match will now ignore function words (in, to), conjunctions (for, but), articles (a, the) and other words that don't impact the intent of the query
  - <https://support.google.com/google-ads/answer/7478529>

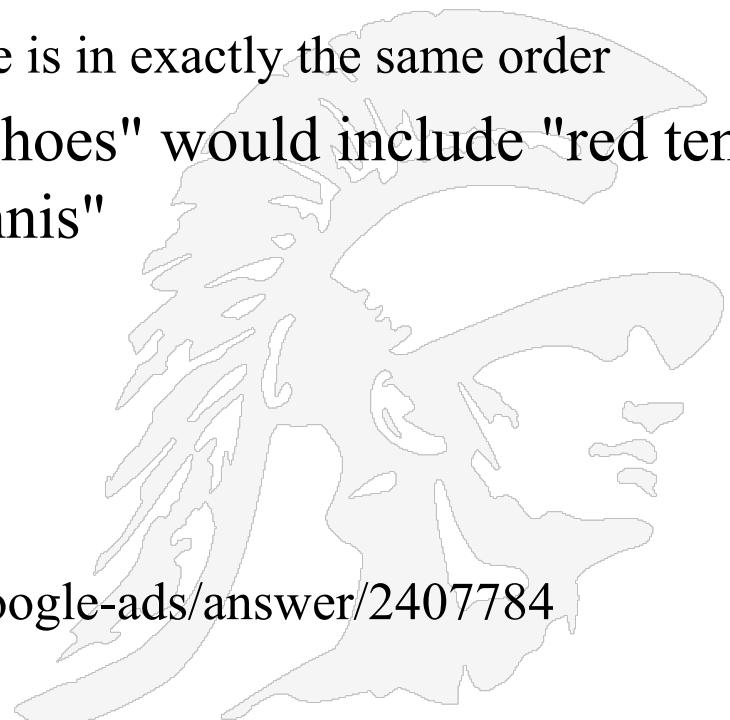
Keyword	Query	Why it matched
jobs in united states nike shoes women	jobs <b>in</b> the united states nike shoes <b>for</b> women	Function words added
parks <b>in</b> san diego paint for <b>a</b> deck	parks san diego paint for deck	Function words removed
news <b>from</b> today bahamas cruise <b>from</b> miami	news <b>for</b> today miami <b>to</b> bahamas cruise	Function words changed



<https://support.google.com/google-ads/answer/2497825>

# Keyword: Phrase Match

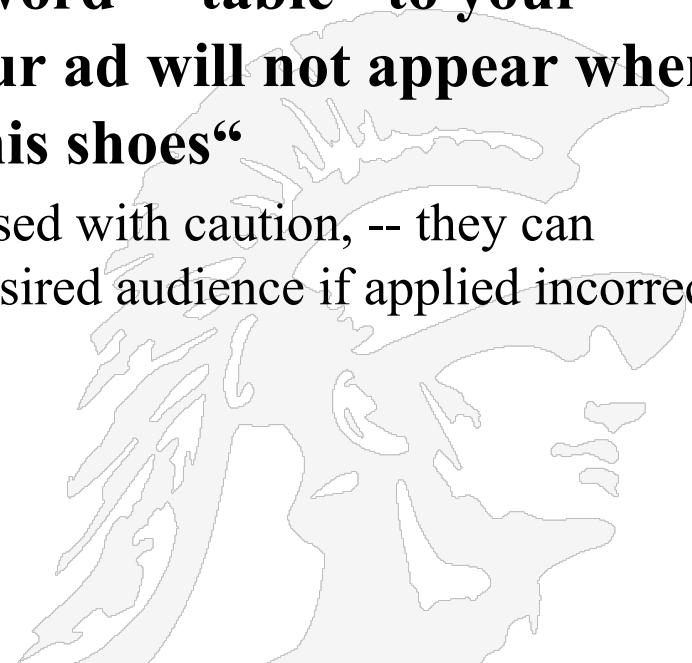
- Your ad appears when users search on the exact phrase
  - AND when their search contains additional terms
    - As long as the keyword phrase is in exactly the same order
  - A phrase match for "tennis shoes" would include "red tennis shoes" but not "shoes for tennis"



<https://support.google.com/google-ads/answer/2407784>

# Keyword: Negative Keyword

- **Negative keywords allow you to eliminate searches that you know are not related to your message**
  - If you add the negative keyword "**–table**" to your keyword "**tennis shoes,**" your ad will not appear when a user searches on "**table tennis shoes**"
    - Negative keywords should be used with caution, -- they can eliminate a large portion of a desired audience if applied incorrectly



<https://support.google.com/google-ads/answer/2453972>

# A Sample Google Ads Campaign Screen



Google AdWords: Campaign Summary - Mozilla Firefox

File Edit View History Bookmarks Yahoo! Tools Help

51.5 minutes saved

https://adwords.google.com/select/CampaignSummary

All Campaigns

+ Create a new campaign : keyword-targeted | site-targeted

Jan 29, 2003 to Feb 7, 2007

Campaign Name	Current Status	Current Budget [?]	Clicks ▾	Impr.	CTR	Avg. CPC	Cost
Campaign #2	Deleted	[ \$10.00 / day ]	747	87,551	0.85%	\$0.44	\$326.34
Campaign #1	Deleted	[ \$5.00 / day ]	328	9,893	3.31%	\$0.53	\$174.94
Total - all 2 campaigns	-	\$0.00 / day active campaigns	1,075	97,444	1.10%	\$0.47	\$501.28

Find: money

Next Previous Highlight all Match case

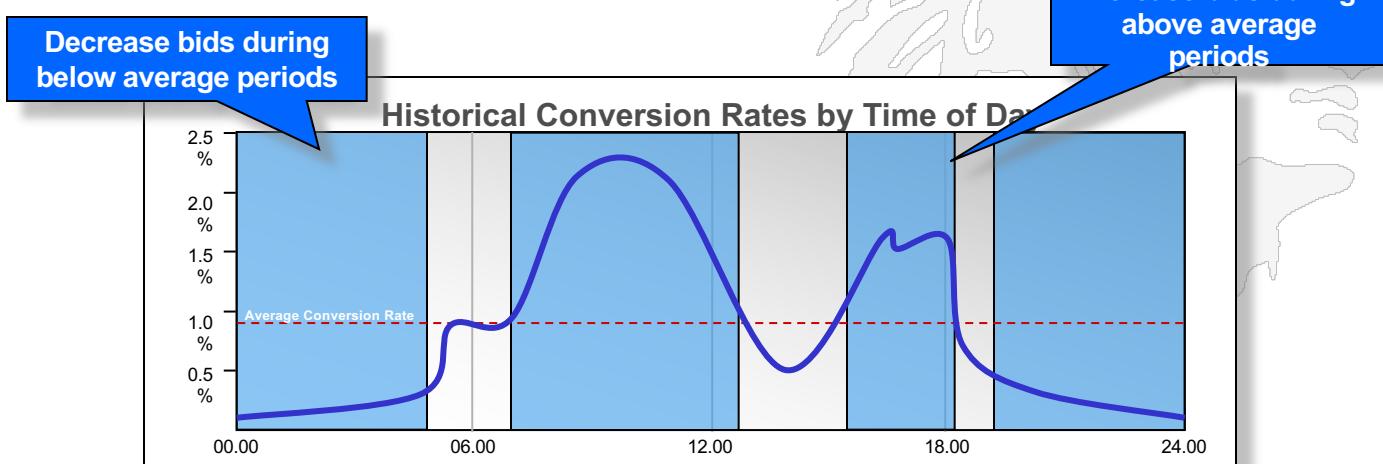
- **Ads advertisers create advertising campaigns**
  - There are two campaigns defined above
- **Each campaign has a set of keyword and associated ads, and includes**
  - a budget, recorded clicks, recorded impressions, click thru rate, average cost/click, and total cost of the campaign

# Capabilities of Search Engine Ad Servers

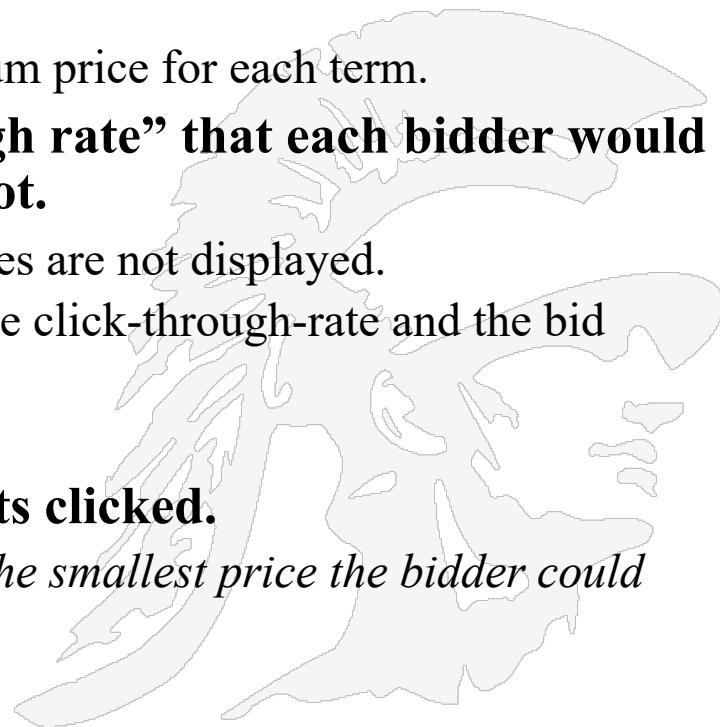
- **The typical common functionality of ad servers includes:**
  - Uploading the creative (*creative* is the term used to describe the ad that will appear)
  - Maintaining business rules for placing ads
  - Targeting ads to different users or content
  - Optimizing appearance of a set of creatives based upon results (choosing the most effective ad)
  - Reporting impressions, clicks, post-click activities, and interaction metrics.
- **Advanced functionality may include:**
  - *Frequency capping* creatives so users only see messages a limited amount of time.
  - *Sequencing* creatives so users see messages in a specific order (sometimes known as surround sessions).
  - Excluding competitive creatives so users do not see competitors' ads directly next to one another.
  - Displaying creatives so an advertiser can own 100% of the inventory on a page (sometimes known as roadblocks).
  - Targeting creatives to users based on their previous behavior (behavioral marketing or behavioral targeting).

# Search Engine Ad Servers are Versatile

- Advertisers with accounts on Google's Ads can define a set of criteria for placement of their ad; typical criteria might include rules such as
  - Only display my ad
    - from 9:00AM-5:00PM EST
    - once/day
    - if the viewer is located in the United States
  - dayparting* is a technique that involves increasing your bids during times when conversion rates are typically above average, and decreasing them when rates are typically below average



- **Each bidder specifies (i) search terms that trigger its bid and (ii) the amount to bid for each search term.**
  - Bidders may also establish an overall ad budget and limits for each kind of bid.
  - Google may set a reserve or minimum price for each term.
- **Google estimates the “click-through rate” that each bidder would have if it were listed in the first spot.**
  - Ads with very low click-through rates are not displayed.
  - Google ranks bids by multiplying the click-through-rate and the bid amount.
  - Ads are displayed in rank order.
- **Google is paid only when an ad gets clicked.**
  - In that case, the price it receives is *the smallest price the bidder could have bid to get its ranking*.

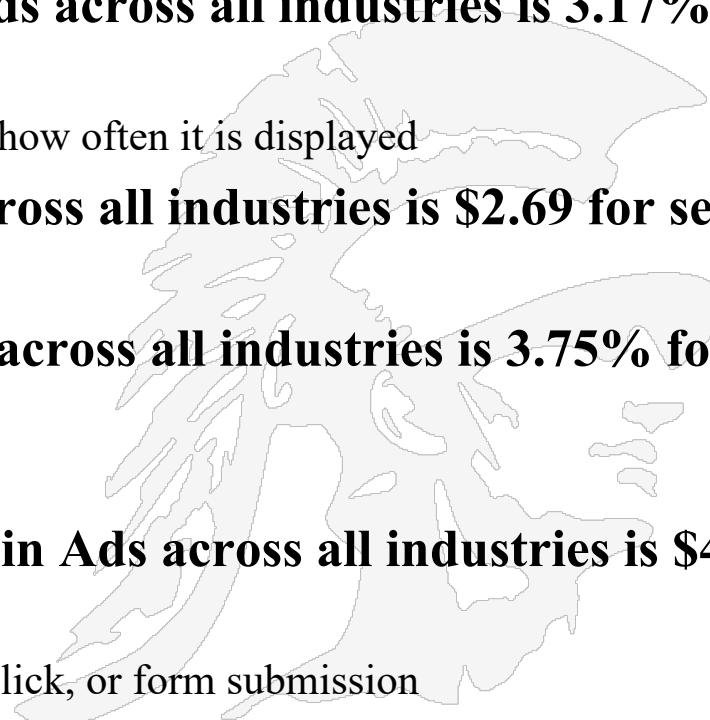


# How does AdWords bidding work?

- The actual position of your ad is determined by your ad rank (Maximum Bid multiplied by the Quality Score).
- The highest ad rank gets the 1<sup>st</sup> ad position.
- Your actual CPC (cost per click) will be determined by the ad rank of the next highest ad below you
- **Exception:** when you are the only bidder or the lowest bid in the Ads auction; then you pay your maximum bid per click!
- Ads bidding heavily penalizes advertisers who bid with low quality scores. Conversely, those with high Quality Scores get higher ad ranks and lower CPC
- The average cost per click on Ads varies by keyword and industry, but is roughly \$2.00 on the search network and \$0.58 on the display network

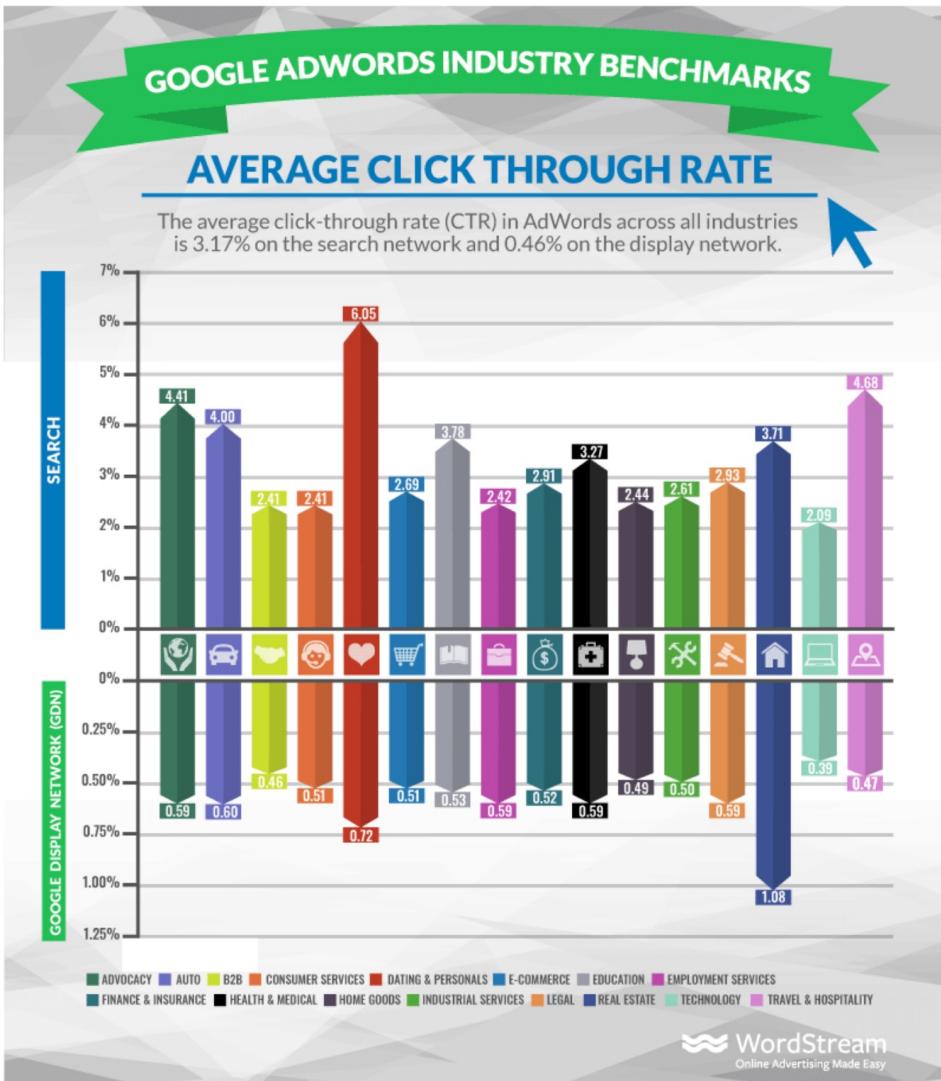
## Some Facts About Online Advertising

- <https://www.wordstream.com/blog/ws/2016/02/29/google-adwords-industry-benchmarks>
- A study of over 14,000 US based clients in multiple markets
- The average *click-through rate* in Ads across all industries is 3.17% for search and 0.46% for display ads
  - How often people click on your ad versus how often it is displayed
- The average *cost per click* in Ads across all industries is \$2.69 for search and \$0.63 for display
- The average *conversion rate* in Ads across all industries is 3.75% for search and 0.77% for display
  - How often a click on an ad leads to a sale
- The average *Cost Per Action (CPA)* in Ads across all industries is \$48.96 for search and \$75.51 for display
  - Refers to a specific action such as a sale, click, or form submission



GDN refers to the Google Display Network where ads are placed on 3<sup>rd</sup> party websites

# Average Click Thru Rate by Industry



Bars in order:

- Advocacy
- Auto
- B2B
- Consumer services
- Dating and personals
- E-commerce
- Education
- Employment services
- Finance & insurance
- Health & medical
- Home goods
- Industrial services
- Legal
- Real estate
- Technology
- Travel & hospitality

# Second Price Auction Using Only Bid Amount

- In a **First-Price Auction** if your bid wins, you pay exactly what you bid. This maximizes revenue potential for the seller.
- A **Second-Price Auction** is a digital buying model where if your bid wins, you pay \$0.01 above the **second** highest bid in the **auction**.
  - In this type of **auction**, it is in your best interest to bid the highest amount you are willing to pay, knowing that often you will end up paying less than that amount.

*Bid2:* (\$9)

*Bid3:* (\$6)

*Bid1:* (\$5)

- **Bidder 2 is ranked 1<sup>st</sup>**
  - Pays  $\$6+1\text{¢}=\$6.01$
- **Bidder 3 is ranked 2<sup>nd</sup>**
  - Pays  $\$5+1\text{¢}=\$5.01$

Let  $P(C)$  be the Probability  
of the Ad Being Clicked

*Bid2:* \$9     $P(C)=0.1$

*Bid3:* \$6     $P(C)=0.1$

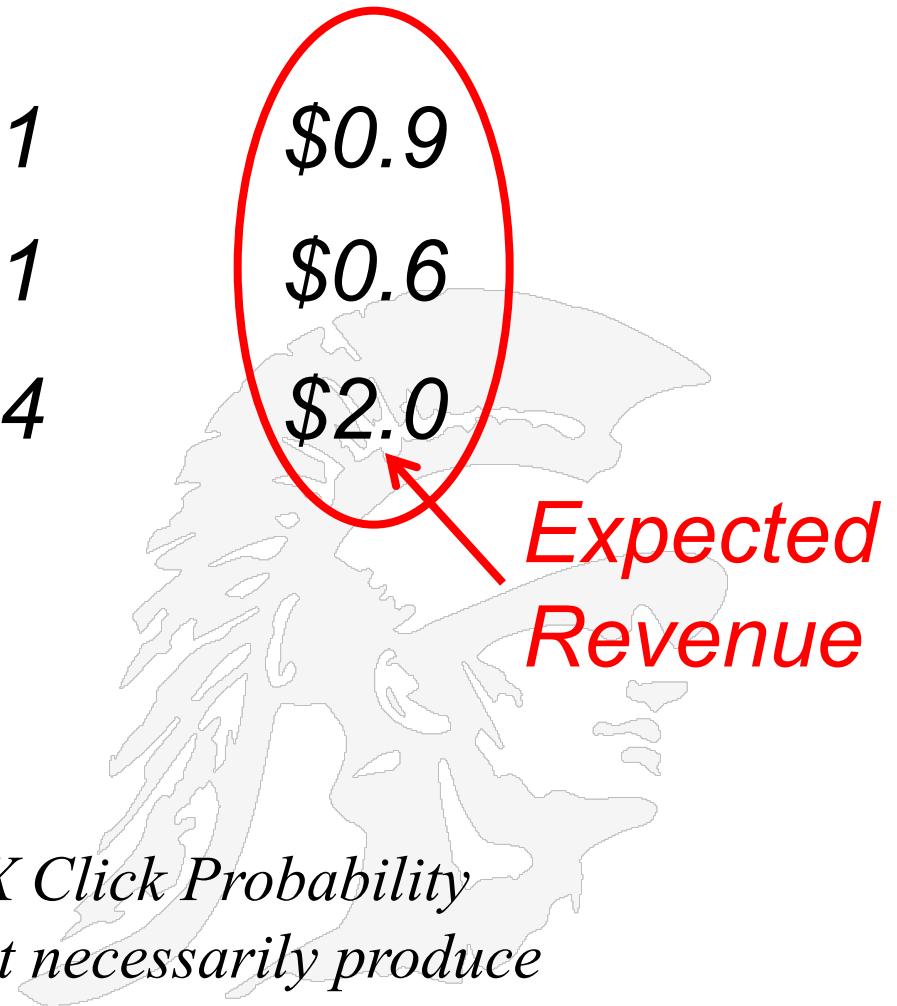
*Bid1:* \$5     $P(C)=0.4$

$P(c)$  can depend upon:

- Historical click performance of the ad
- Landing page quality
- Relevance to the user
- User click through rates

*Expected Revenue = Bid amount X Click Probability*

*So the ad with highest bid does not necessarily produce the most revenue*



## Google Ranks Ads by the Product of Bid Amount\*Click Probability

*Bid1:* \$5     $P(C)=0.4$

*is placed 1st*

*Bid2:* \$9     $P(C)=0.1$

*is placed 2nd*

*Bid3:* \$6     $P(C)=0.1$

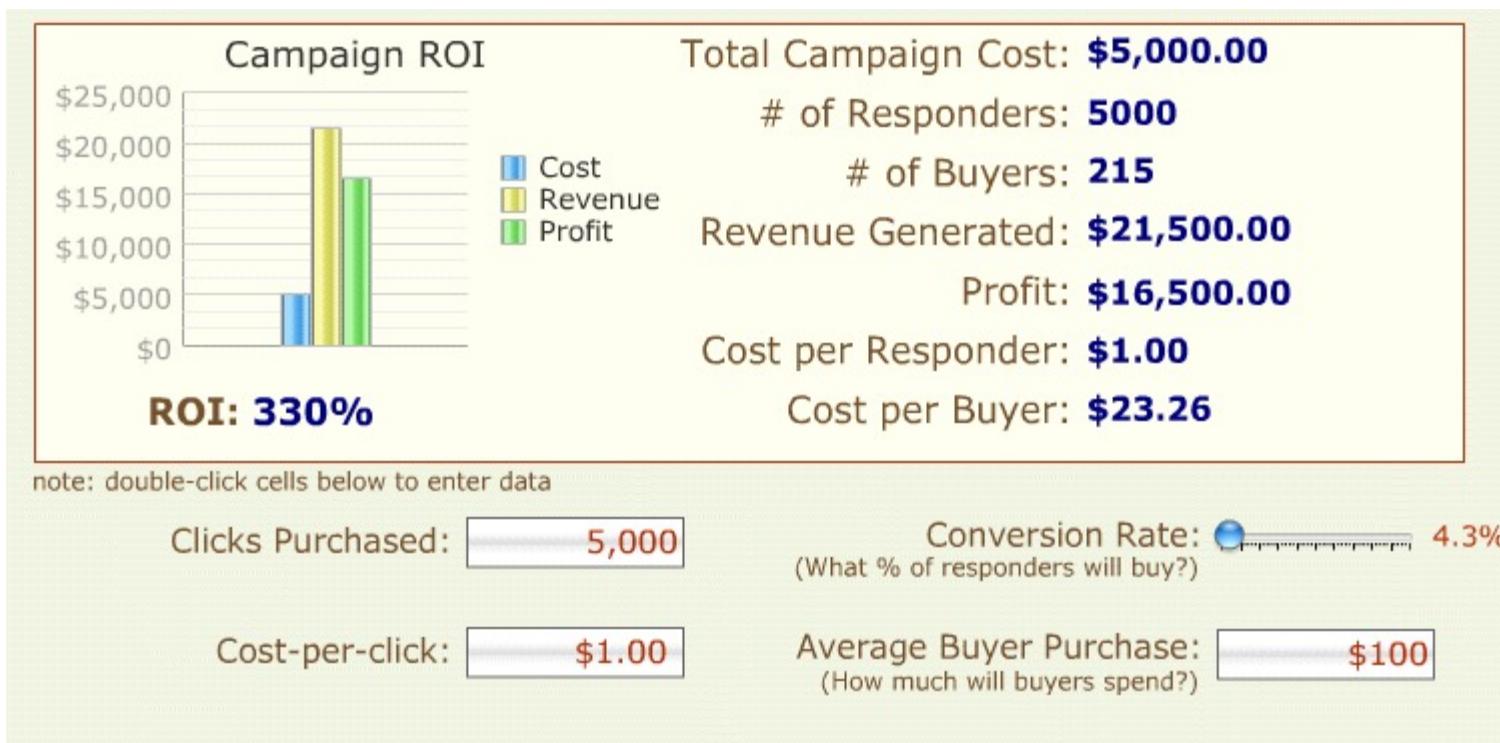
*is placed 3rd*

**Ad Rank= Bid X Click Probability**

# Return On Investment: What is Each Conversion Worth?



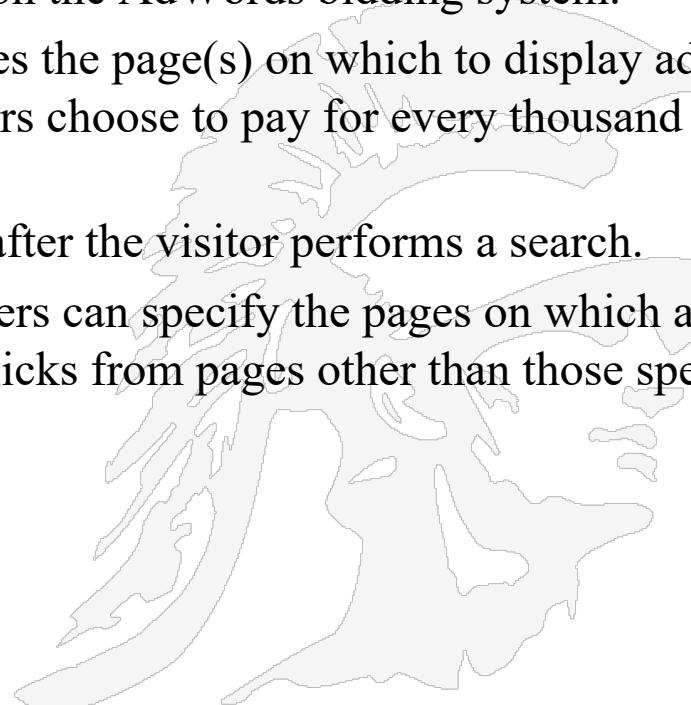
# Improved Conversion Rate



- AdSense from Google is a service for placing Google ads on third party web pages
- Google purchased the content matching technology from Oingo, a small Santa Monica-based search engine in 2003 for \$102 million
- The program is designed for website publishers who want to display targeted text, video or image advertisements on their website pages and earn money when site visitors view or click the ads
- Typically Google keeps 32% of the ad revenue and returns 68% to the website developer
- In addition to cost-per-click ads, Google also offers
  - *Cost per Thousand* displays, CPM
  - *Cost per Engagement*, where advertisers only pay when users actively engage with ads, e.g. hovering over them or expanding them or reviewing the landing page for more than a few seconds
- **Typically blogs use AdSense to monetize their site**

# How AdSense Works

1. The webmaster inserts the AdSense JavaScript code into a webpage.
2. Each time this page is visited, the JavaScript code uses inlined JSON to display content fetched from Google's servers.
3. Google's servers use a cache of the page to determine a set of high-value keywords. Ads are served for those keywords based on the AdWords bidding system.
4. For site-targeted ads, the advertiser chooses the page(s) on which to display ads, and pays based on CPM, or the price advertisers choose to pay for every thousand advertisements displayed.
5. Search ads are added to the list of results after the visitor performs a search.
6. To protect against fraud, AdSense customers can specify the pages on which ads should be shown. AdSense then ignores clicks from pages other than those specified.



Google's AdSense program claims to place ads on third-party websites, where the ads are **relevant** to the site's content;

Each time a visitor visits a page with an AdSense tag, a piece of JavaScript writes an iframe tag, whose src attribute includes the URL of the page. Google's servers use a cache of the page to determine a set of high-value keywords.

**Special Reports**

Make phone calls through your high-speed internet connection.  
**glingo**  
 The life of broadband  
[SIGN UP NOW!](#)

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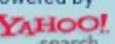
**SERVICES**

[Video](#)  
[E-mail Newsletters](#)  
[Your E-mail Alerts](#)  
[RSS](#)  
[CNNtoGO](#)  
[TV Commercials](#)  
[Contact Us](#)

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**SEARCH**

Web  

[Search](#) Powered by 

**Changing stories and fuzzy details on specific dates are consistent with the way children who are victims of sexual abuse behave, an expert testified Monday at the Michael Jackson trial.**

But under cross-examination, Anthony Urquiza acknowledged that his expertise did not extend to false allegations of sexual abuse, which he had not studied.

The testimony came as prosecutors in Jackson's child molestation trial tried to shore up earlier contradictory statements made by the pop star's accuser.

Jackson arrived late again Monday, walking with assistance into the Santa Maria, California, courthouse. Jackson offered a weak wave to supporters as he arrived, then made his way inside.

Santa Barbara County Superior Court Judge Rodney Melville, who threatened to jail Jackson after a similar episode on

## AdSense Ads on Websites are Not Always Relevant



Michael Jackson is escorted out of the courtroom shortly after arriving.

**Image:** 

advertiser links [what's this?](#)

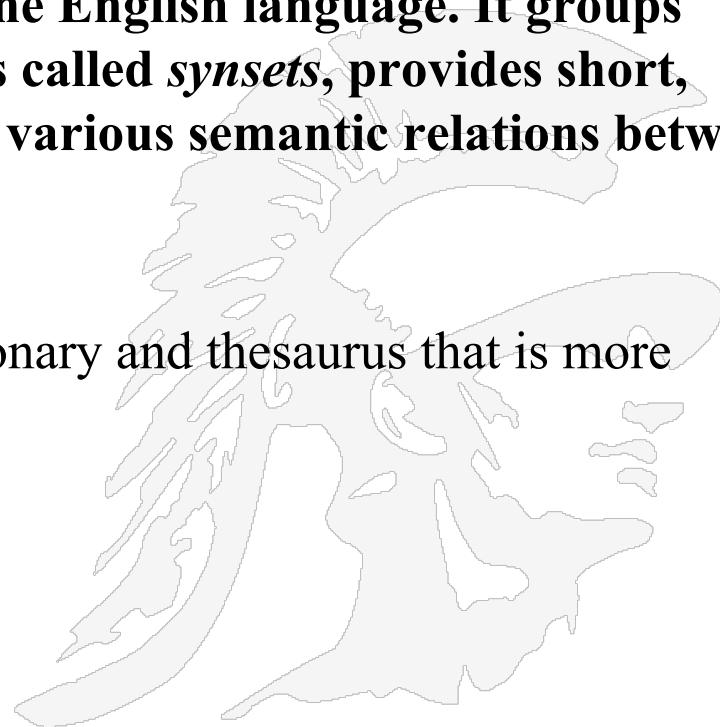
[MyCashNow - \\$100 - \\$1,000 Overnight](#)  
 Payday Loan Cash goes in your account overnight. Very low fees. Fast decisions....  
[www.mycashnow.com](http://www.mycashnow.com)

[Refinance Rates Hit Record Lows](#)  
 Get \$150,000 loan for \$625 per month.

Above, an article about Michael Jackson includes an irrelevant ad about payday loans

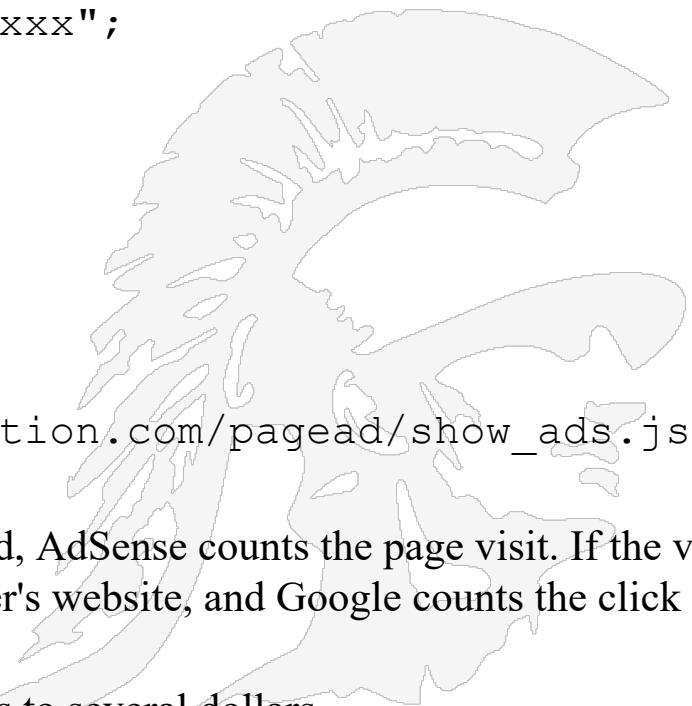
# Adsense Content Matching Originally Based on WordNet

- AdSense technology is based upon a database of word meanings initially developed at Princeton, called WordNet
  - <https://wordnet.princeton.edu/>
- WordNet is a semantic lexicon for the English language. It groups English words into sets of synonyms called *synsets*, provides short, general definitions, and records the various semantic relations between these synonym sets.
  - The purpose is twofold:
    1. to produce a combination of dictionary and thesaurus that is more intuitively usable, and
    2. to support automatic text analysis.



# AdSense Code

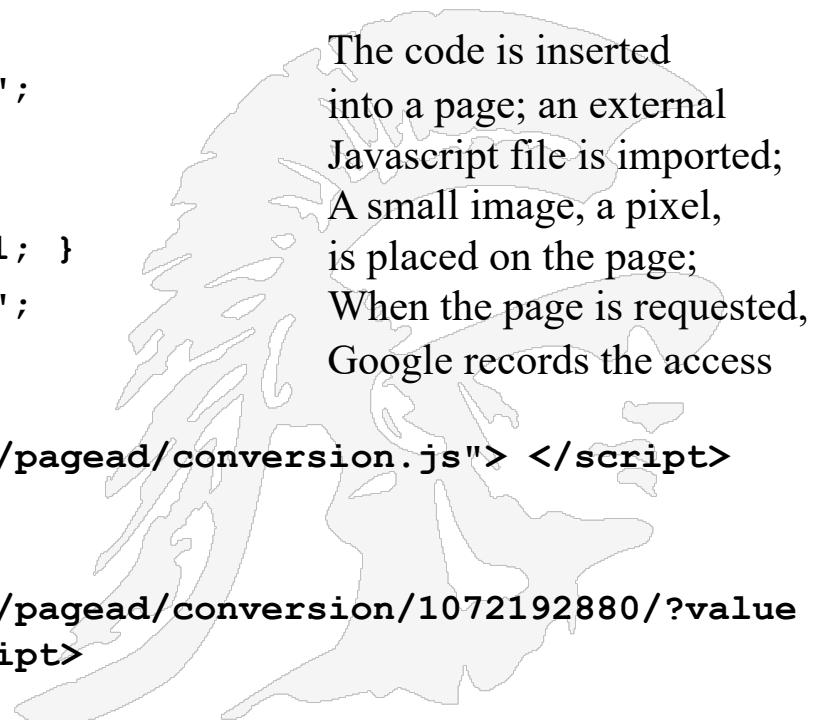
- Google AdSense creates the code, which the publisher copies and pastes into a web page or blog post at the point where it is to appear.
- This is an example of AdSense code for a 728-by-90-pixel ad. Google assigns the numbers following "google\_ad\_client" and "google\_ad\_slot."
- ```
<script type="text/javascript"><!--
google_ad_client = "xxxxxxxxxxxxxxxxxx";
/* 728x90, created 10/28/08 */
google_ad_slot = "xxxxxxxxxx";
google_ad_width = 728;
google_ad_height = 90;
//-->
</script>
<script type="text/javascript"
src="http://pagead2.googlesyndication.com/pagead/show_ads.js">
</script>
```
- When a webpage containing this code is displayed, AdSense counts the page visit. If the visitor clicks on the ad, s/he is redirected to the advertiser's website, and Google counts the click and credits the AdSense publisher's account
- Payments for clicks on ads range from a few cents to several dollars.



# Sample Google Conversion Code for Tracking Purchases/Sales

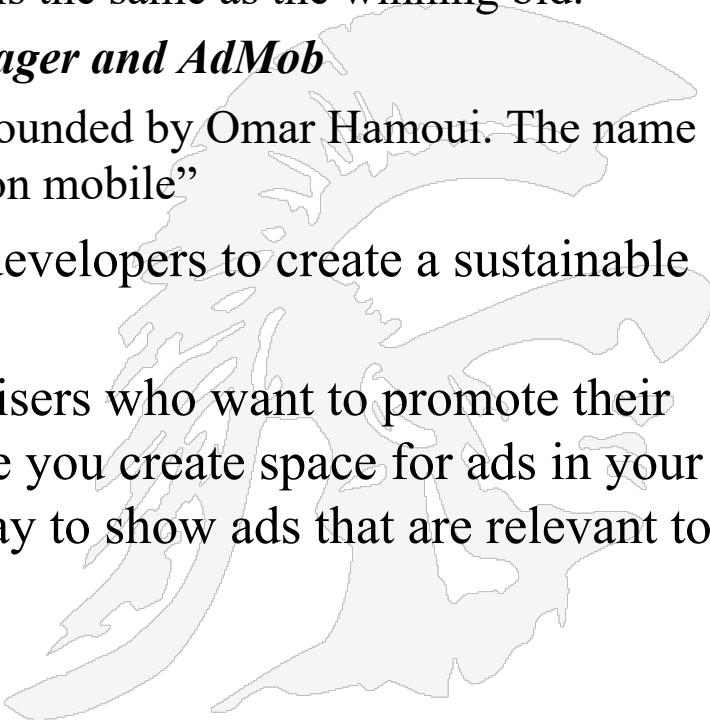
- Google/Yahoo offer tracking pixels
- Tracking pixels are small, typically transparent images on a web page that have special names which permit the loading of the web page to be tracked by a web server.

```
<!-- Google Code for purchase Conversion Page -->  
<script language="JavaScript" type="text/javascript">  
var google_conversion_id = 1072192880;  
var google_conversion_language = "en_US";  
var google_conversion_format = "1";  
var google_conversion_color = "666666";  
if (1) { var google_conversion_value = 1; }  
var google_conversion_label = "purchase";  
</script>  
<script language="JavaScript"  
src="http://www.googleadservices.com/pagead/conversion.js"> </script>  
<noscript>  
 </noscript>
```



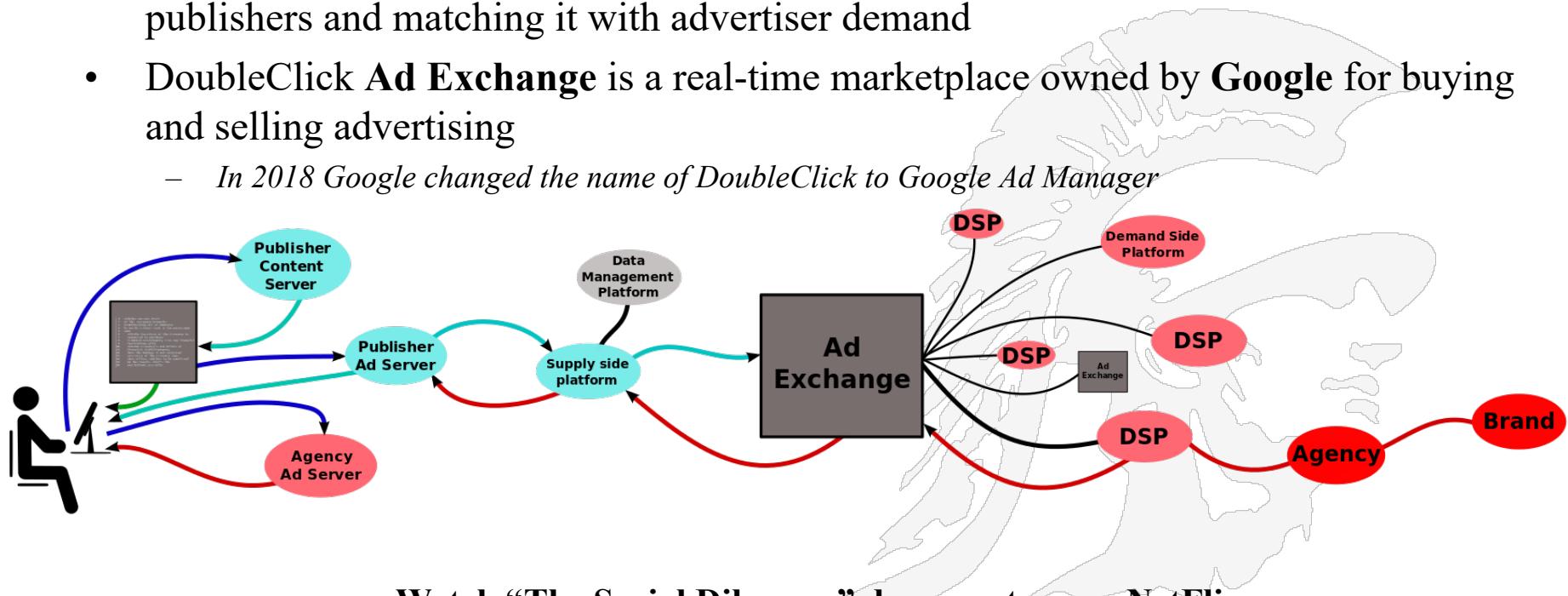
# Google AdSense, AdMob Moves to a First-Price Auction Model

- **First-price vs. second-price auctions**
  - In a second-price auction, the final price paid by the winner is determined by the second-highest bid.
  - In a first-price auction, the final price is the same as the winning bid.
- ***This change applies to AdSense, Ad Manager and AdMob***
- AdMob is a mobile advertising company founded by Omar Hamoui. The name AdMob is a portmanteau for "advertising on mobile"
- Showing ads to app users allows app developers to create a sustainable source of revenue
- Ads are created and paid for by advertisers who want to promote their products or services to app users. Once you create space for ads in your app, AdMob works with advertisers who pay to show ads that are relevant to your users



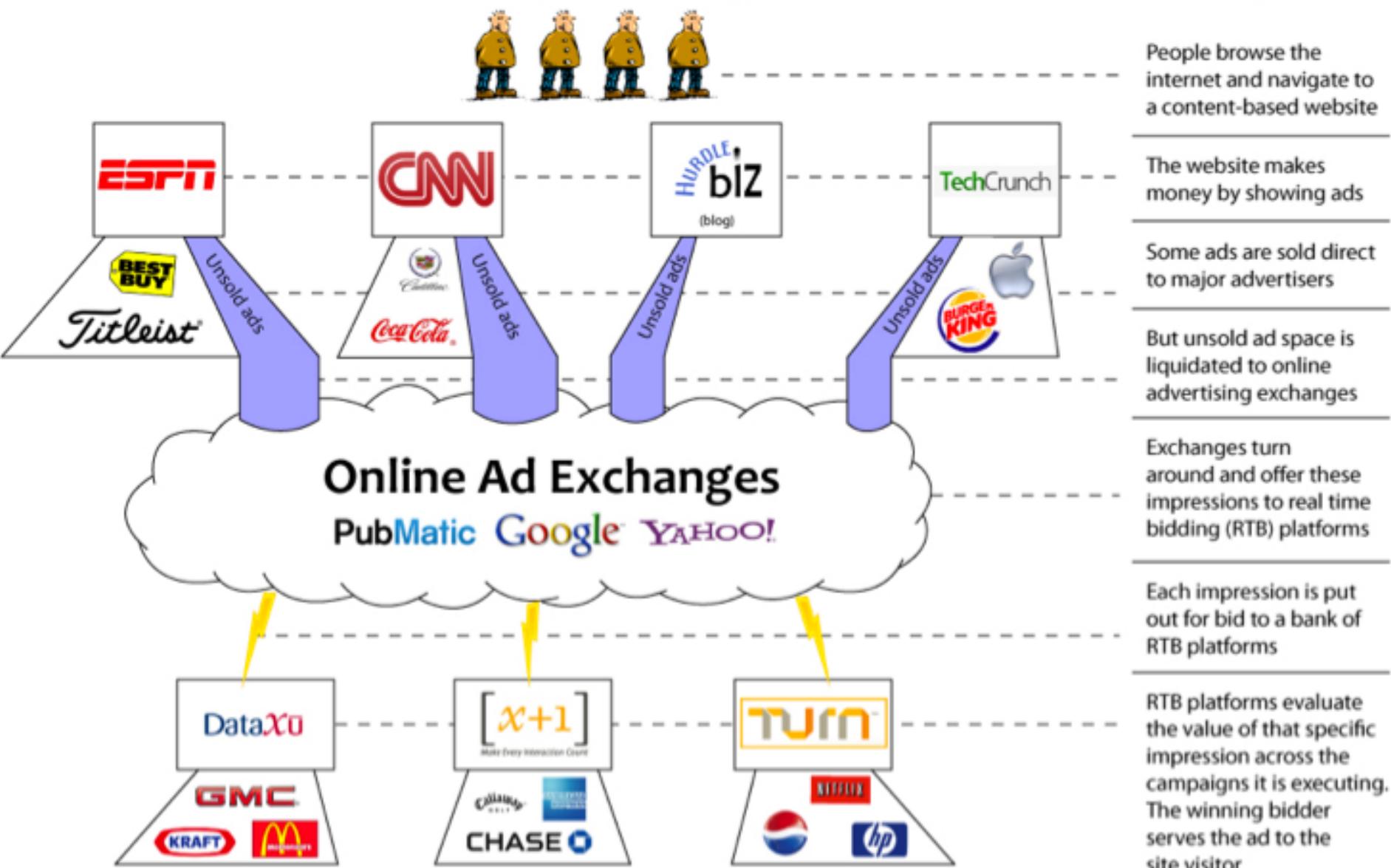
# Ad Exchanges and DoubleClick

- An **ad exchange** is a technology platform that facilitates the buying and selling of media advertising inventory from multiple **ad** networks.
- Prices for the inventory are determined through technology-driven bidding
- The key function of an **ad network** is aggregation of **ad** space supply from publishers and matching it with advertiser demand
- DoubleClick **Ad Exchange** is a real-time marketplace owned by **Google** for buying and selling advertising
  - In 2018 Google changed the name of DoubleClick to Google Ad Manager



Watch “The Social Dilemma” documentary on Netflix  
<https://www.netflix.com/title/81254224>

# The Real-Time Bidding Paradigm in Online Advertising



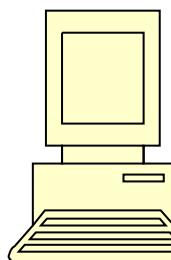
# Today's advertising model

Publishers

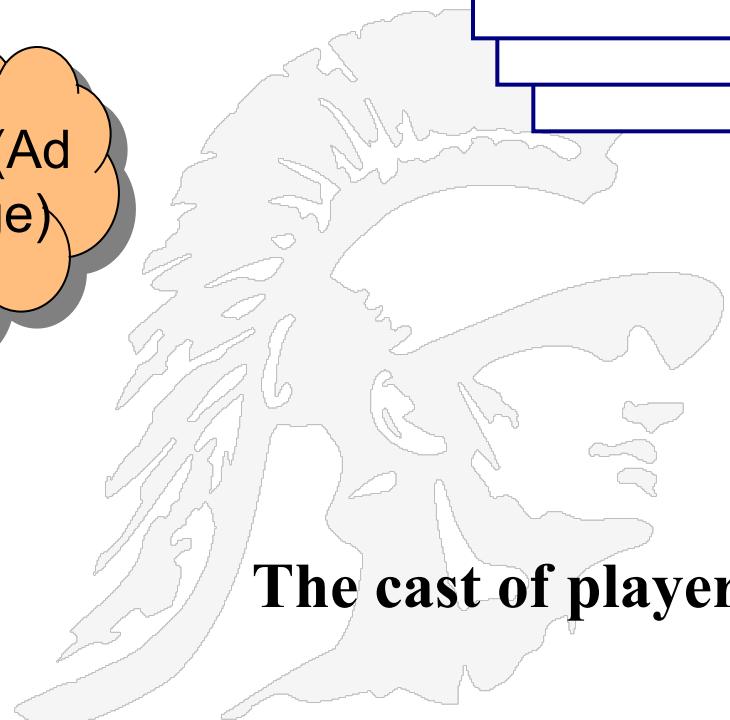
Trackers

Advertisers

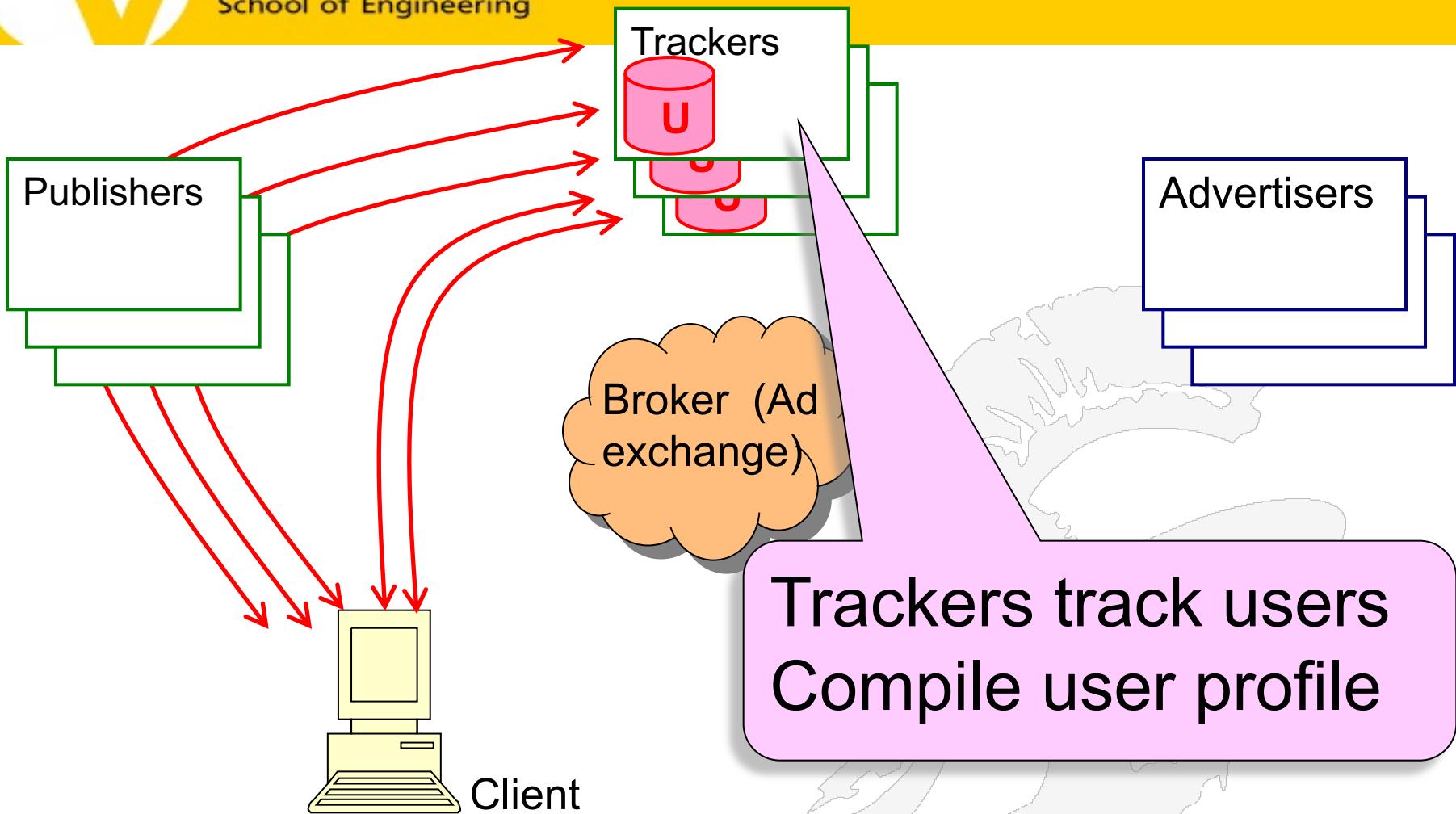
Broker (Ad  
exchange)

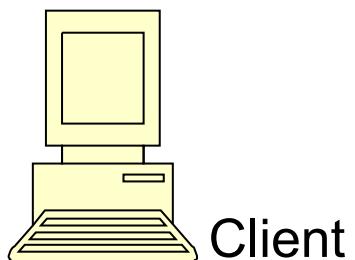
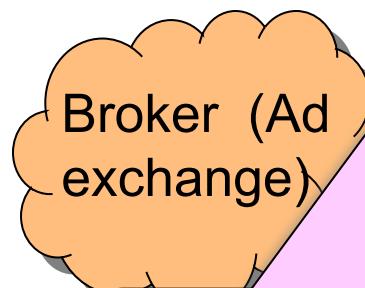
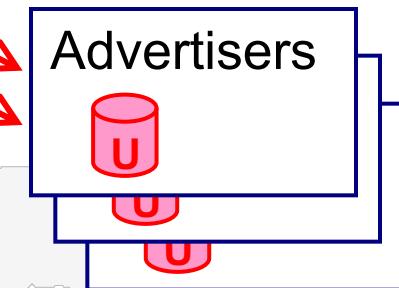
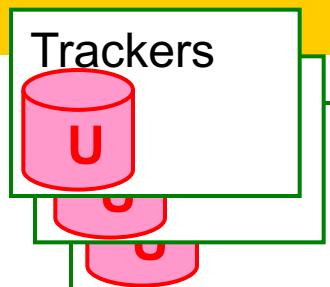
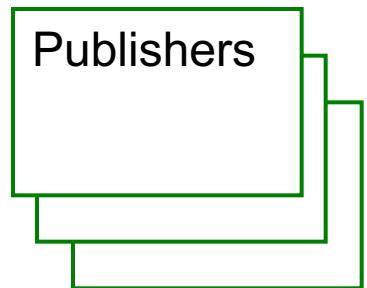


Client

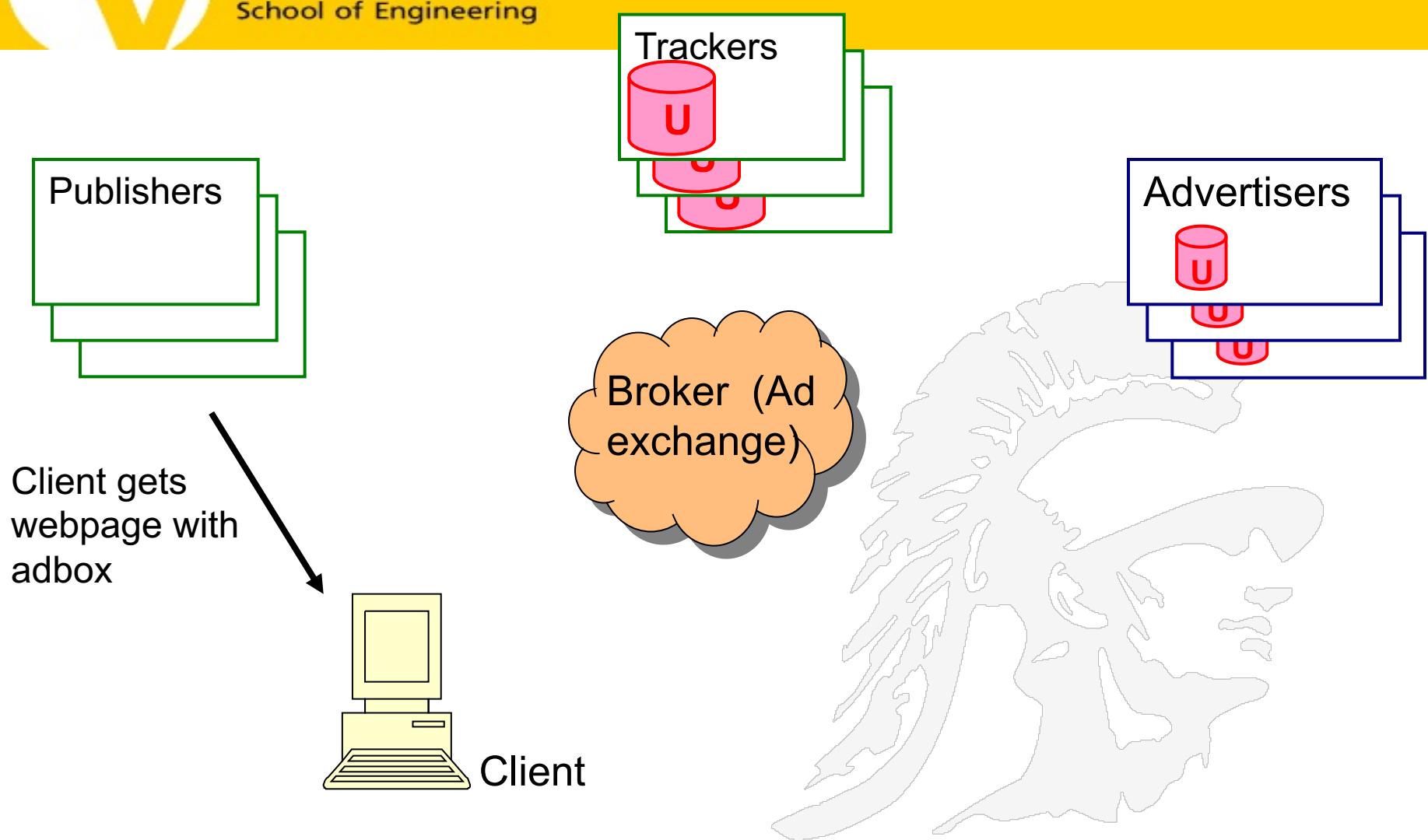


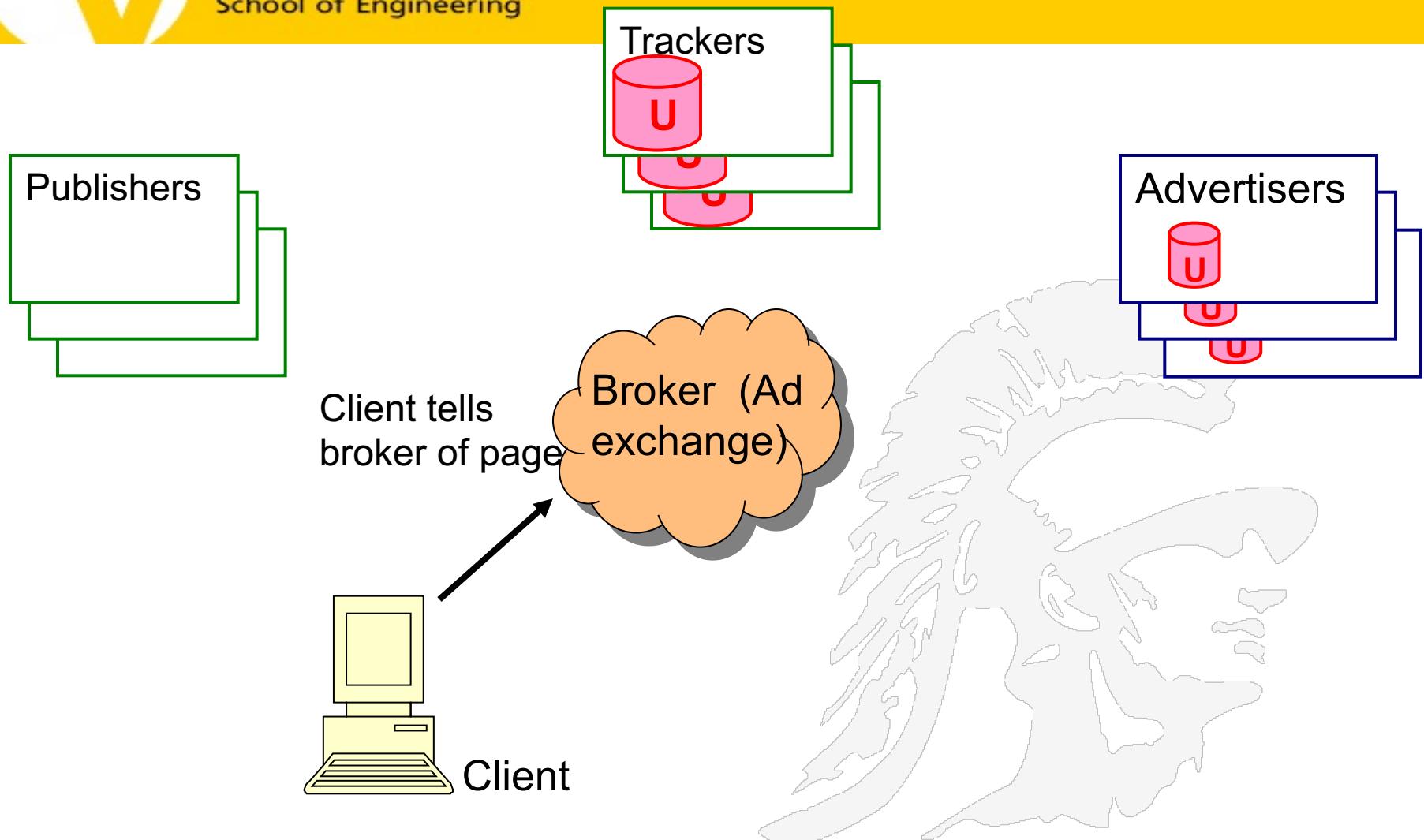
## The cast of players





Trackers may share  
profiles with advertisers?





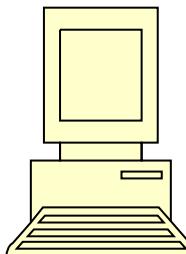
Publishers

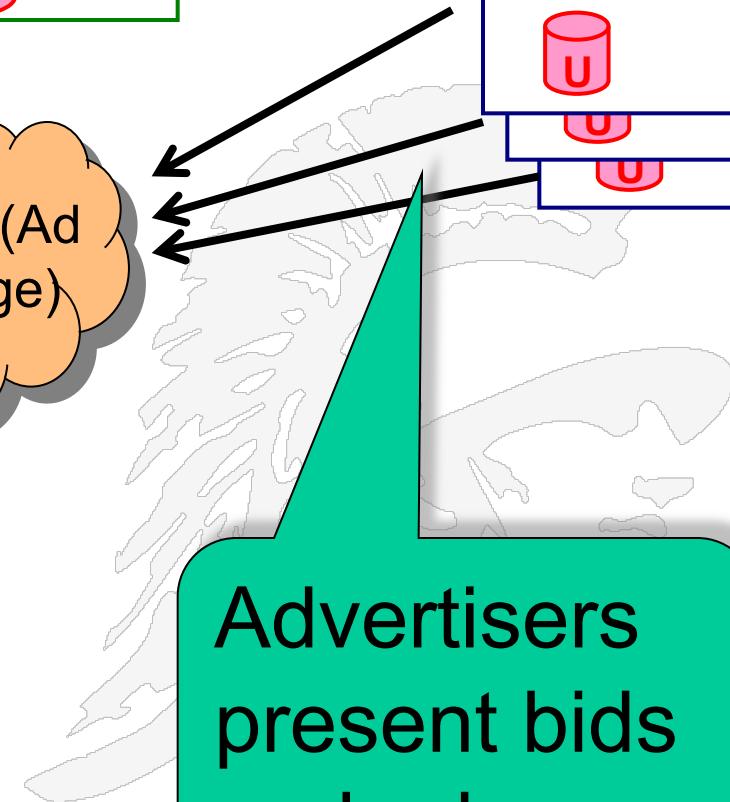
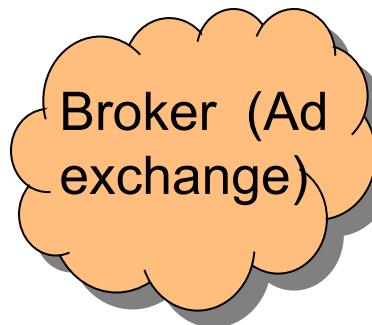
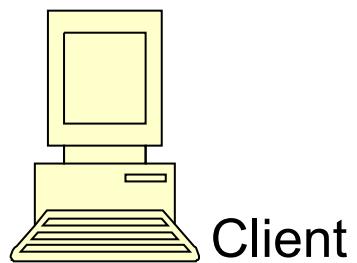
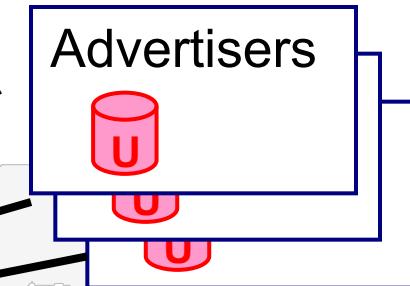
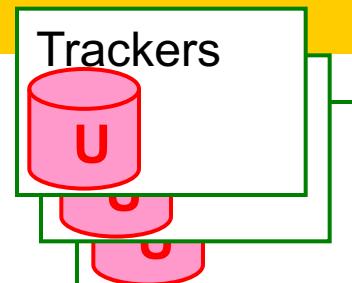
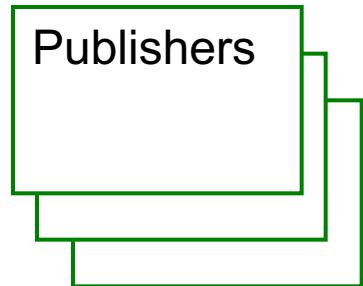
Trackers

Advertisers

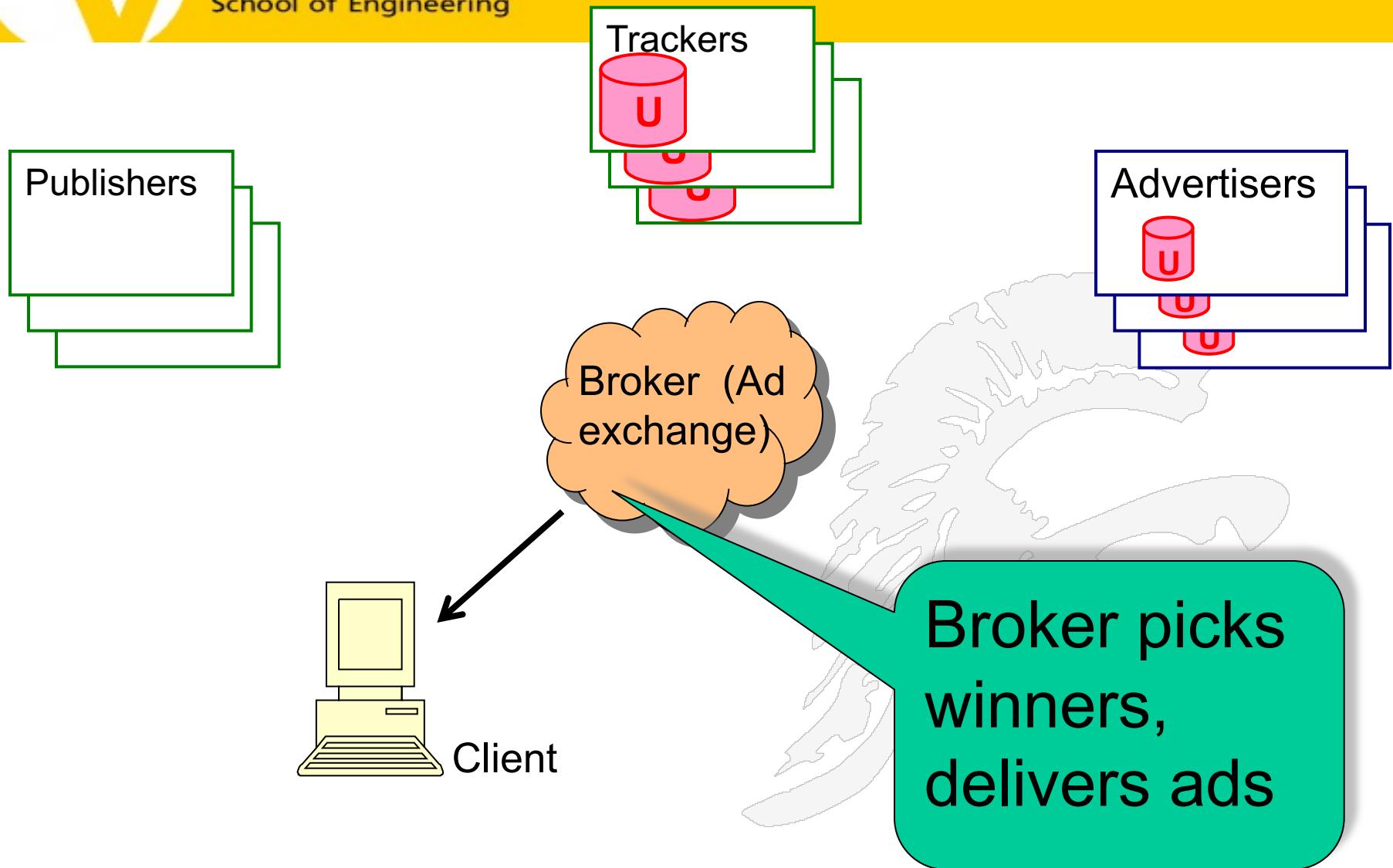
Broker (Ad  
exchange)

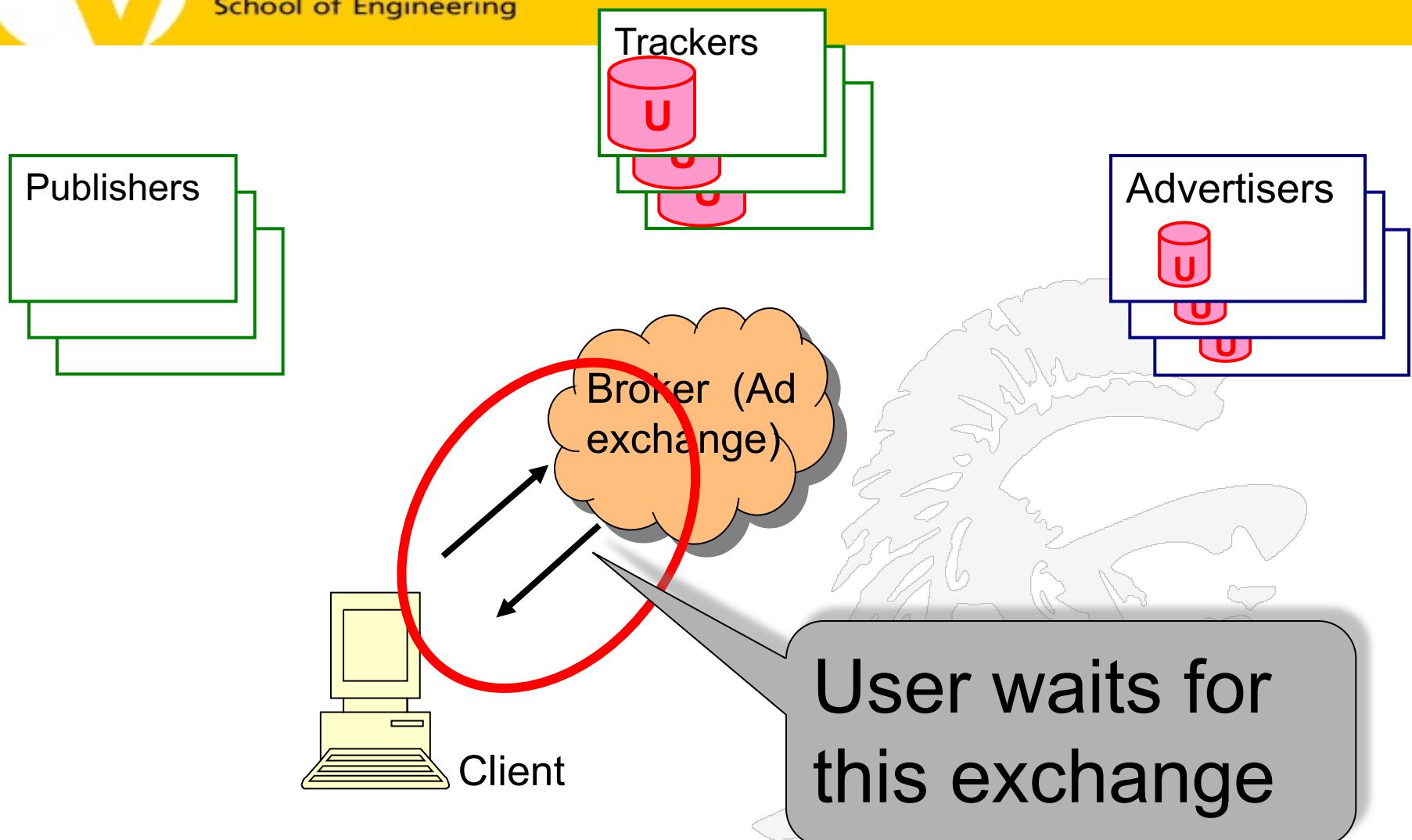
Broker launches auction  
(for given user visiting  
given webpage ....)  
Also does clickfraud etc.

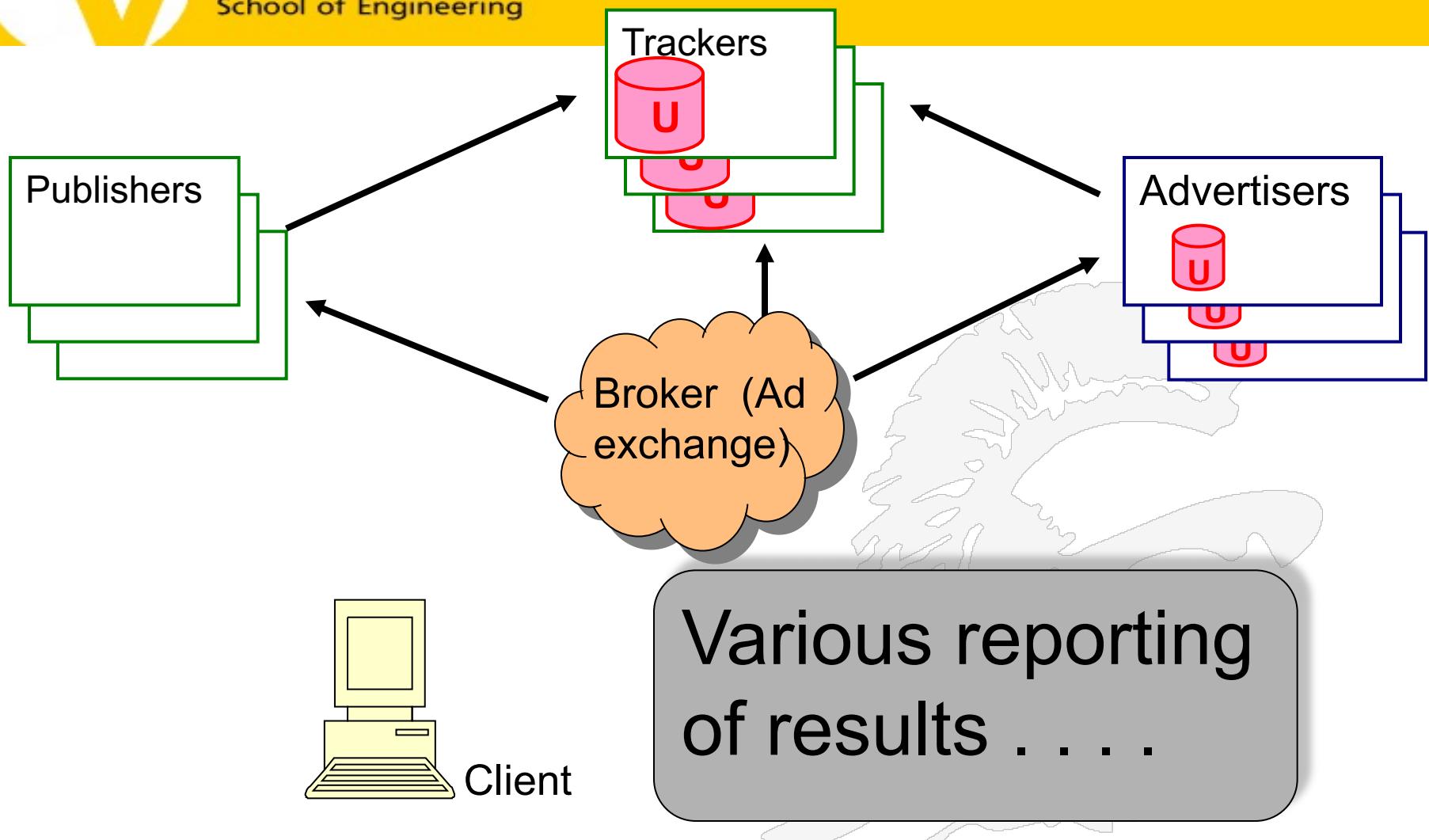




Advertisers  
present bids  
and ads







# How an Advertising Network such as DoubleClick Works

