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# Online Advertising Business Models, Technologies and Issues: From “Mad Men” to Wall Street

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**RuSSIR 2009, Petrozavodsk, Russia**

**3<sup>rd</sup> Russian Summer School in Information Retrieval**

**September 11 – September 16, 2009**

# Brief Bio

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- **20 years in the field AI and information management**
  - Principal and Founder, Boutique Data Consultancy
    - Clients include: Digg, SearchMe, SkyGrid, MyOfferPal, Ancestry.com
  - Adjunct Faculty, University of California Santa Cruz (UCSC)
  - Chief Scientist, Turn Inc. (A CPX ad network, Bay Area, CA)
  - Principal Scientist, Clairvoyance Corp (CMU spinoff; sister lab to JRC)
  - Research Scientist, Xerox Research
  - Research Engineer, Mitsubishi Group
  - PhD in machine learning (1998), University of Bristol, UK;  
B.Sc. Comp. Science (1989), Uni. of Limerick, Ireland
- **Now: Machine Learning Consultant (San Francisco)**
  - IF *(you have large **data problems** and need a consultant)*  
THEN *{email me at [James.Shanahan\\_AT\\_gmail.com](mailto:James.Shanahan_AT_gmail.com)}*
  - Where **problems**  $\in$  {web search, online advertising, machine learning, ranking, user modeling, statistics, social networks, “\*”}

# Disclaimer

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- **The Author retains all rights, including copyrights and distribution rights.**
- **No publication or further distribution in full or in part permitted without explicit written permission from the author**
- **Living vicariously!**

# From Mad Men To....

- Set in New York City, *Mad Men* begins in 1960 at the fictional Sterling Cooper advertising agency on New York City's Madison Avenue. (Broadcast by AMC Cable Channel)
- The show centers on Don Draper ([Jon Hamm](#)), the agency's creative director, and the people in his life in and out of the office.





# From Mad Men To Wall Street

- Set in New York City, *Mad Men* begins in 1960 at the fictional Sterling Cooper advertising agency on New York City's Madison Avenue.



**Human Intensive  
Lots of guess work  
Forward Market**



**Technology  
Data Driven  
Forward Market  
Spot Markets**

# Executive Summary

- Advertisers deliver a message to consumers via publishers
- Online advertising revenue growing annually @ 10% (from 26%)
  - \$23.4 billion in USA (2008), \$65B worldwide (10% of overall ad spend)
  - Business Models: CPM, CPC, CPA (not popular yet but will be), dCPM
  - Online advertising is location, location and location (\$11B M&A, 2007)
  - ....and data, features, objectives and optimization
- Key directions
  - Forward markets → **Spot Markets**
    - Advertising transformed from a low-tech, “Mad Men” process to highly optimized, mathematical, computer-centric (Wall Street-like) process
  - **Technology:** Economics, IR, ML, OR, Game Theory, Stats, Social Sciences (estimating CTR/AR; auction systems; learning algorithms; targeting display advertising; behavioral targeting)
  - **Click fraud** is the spam of online advertising (\$Billion problem)
  - **New Directions:** Web 3.0; games; social advertising; data exchanges
  - **Gap:** perceived gap between academia and industry?

Online advertising is sometimes known as computational advertising but this is limiting

# Outline: CoAd

- Introduction
  - Online advertising background
  - Business models
  - Creating an online ad campaign
  - Technology and Economics
    - Forward Markets (Operations research)
    - Auction Theory and Game Theory
    - Spot Markets (ML, IR, Ranking, Quality)
  - New Directions
  - Challenges in online advertising
  - Summary
- Business, Gold rush**
- Tech**
- Hot Areas**



# Outline: CoAd Lectures

- Introduction
- L1** • Online advertising background
- Business models, Campaigns

**Business,  
Gold rush**



- L2** • Technology and Economics

- Forward Markets

- Gradient Descent, Operations research, LP, QP

- Auction Theory and Game Theory

- L3** – Spot Markets

- ML, Ad quality, Ranking, Budgeting

**Tech**



- L4** • New Directions

- Challenges in online advertising

- Summary

**Hot Areas**

## CoAd Lectures

Friday	9/11/2009	10:30-12:00
Saturday	9/12/2009	8:30-10:00
Sunday	9/13/2009	8:30-10:00
Monday	9/14/2009	8:30-10:00

# Course philosophy

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- **Socratic Method (more inspiration than information)**
  - participation strongly encouraged (please state your name and affiliation)
- **Highly interactive and adaptable**
  - Questions welcome!!
- **Lectures emphasize intuition, not rigor or detail**
  - Build on lectures from other faculty
  - Background reading will have rigor & detail
- **Action Items**
  - Read suggested books first (and then papers), read/**write** Wikipedia, watch/**make** YouTube videos, take courses, participate in competitions, do internships, network
  - Prototype, simulate , publish, participate
  - Classic (core) versus trendy (applications)

# Advertising

## **Advertising is a paid, one-way communication**

- 1. Deliver marketing messages and attract new customers**
- 2. To inform potential customers about products and services and how to obtain and use them.**
- 3. Many advertisements are also designed to generate increased consumption of those products and services through the creation and reinforcement of brand image and brand loyalty (ads contain both factual information and persuasive messages).**
- 4. Every major medium is used to deliver these messages, including: television, radio, movies, magazines, newspapers, video games, the Internet, and billboards**

**In 2008, Worldwide online advertising was \$65B**

**I.e., 10% of all ad spending across all media [IDC, 2008]**

**[Source: <http://en.wikipedia.org/wiki/Advertising>]**

*RuSSIR 2009, Petrozavodsk, Russia. Online Advertising © 2009 James G. Shanahan (San Francisco)*

*James.Shanahan\_AT\_gmail\_DOT\_com*



# Advertising as Information

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- **Online advertising is a form of advertising utilizing the Internet and World Wide Web in order to deliver marketing messages and attract customers** [wikipedia.com]
- **Advertising annoys people! Advertising works!**
  - *"Half the money I spend on advertising is wasted; the trouble is, I don't know which half."* - [John Wanamaker](#), father of modern advertising.
  - *"I do not regard advertising as entertainment or an art form, but as a medium of information..."*, "Ogilvy on Advertising" by [David Ogilvy](#)
- **Goals of Online advertising**
  - *Deliver/push an advertiser's message with quantifiable measures of consumer interest*
  - *Enable ads as a medium of information!*
  - *Generate revenue for the publisher and ROI for the advertiser*

# Online Advertising Stages

## Parallels with existing media

### 1. Print<->webpages

### 2. Direct Response<->interactivity

### 3. TV<->Online Video

	Stages	ARF Media Model	Questions to answer	Methods and typical sources
1	Getting the Opportunity to Deliver the Message	<ul style="list-style-type: none"> <li>- Vehicle Distribution</li> <li>- Vehicle Exposure</li> <li>- Advertising Exposure</li> </ul>	<ul style="list-style-type: none"> <li>Did anyone see it and how often?</li> <li>Did it get through <u>technical</u> firewalls?</li> </ul>	<p><i>Reach / Frequency</i></p> <p>Sources: audience panels, ad servers, email providers</p>
2	Building Brand and Message Awareness	<ul style="list-style-type: none"> <li>- Advertising Attentiveness</li> <li>- Advertising Communication</li> </ul>	<ul style="list-style-type: none"> <li>Do they know of the brand and the message?</li> <li>Did it get through <u>mental</u> firewalls?</li> </ul>	<p><i>Brand survey data points</i></p> <p>Sources: most commonly third-party survey research companies; could also be inferred from search volume as a related indicator of awareness and interest</p>
3	Increasing Positive Predisposition	<ul style="list-style-type: none"> <li>- Advertising Persuasion</li> <li>- Advertising Response</li> </ul>	<ul style="list-style-type: none"> <li>Do they think favorably of the brand?</li> <li>Would they consider it?</li> </ul>	
4	Causing Behavior	<ul style="list-style-type: none"> <li>- Advertising Response</li> <li>- Sales Response</li> </ul>	<ul style="list-style-type: none"> <li>Did they take action on it?</li> <li>Did they: click/sign up/tell others/go to the store/buy it?</li> </ul>	<p><i>A variety of behavior metrics (e.g., rollover, play, click-thru, view-thru, sales)</i></p> <p>Sources: ad technology, ad/site/email server, retail sales</p>

[Source: <http://www.mb-blog.com/Images/OnlinePOVfinal.pdf>]



# Online Marketing Goal/M Measurement Hierarchy



## Purchase Funnel

1. Cast a wide net (big reach)
2. Corral /Brand
3. Close the sale



**Online Marketing is like courting:  
need to build trust with consumers**

[Source: <http://www.mb-blog.com/Images/OnlinePOVfinal.pdf>]

# From Branding to Direct Marketing

## Branding

a brash st  
CEO have enough  
c with Sun's grim realities. Did this Web 2.0  
ling computer company?

**Hitachi** | true stories

### HOPE IN HOUSTON

The True Story of  
a New Weapon  
in the War on Cancer

Watch how doctors at Houston's renowned  
M.D. Anderson Cancer Center are using proton  
beam therapy to help keep a Baton Rouge pilot  
in the cockpit, and his cancer on the ground.

 **Watch the Film**

**HITACHI**  
Inspire the Next

It didn't take long for Schwartz to show his stuff. Sun, which had fallen far from its perch as one of the highfliers of the dot-com era, has emerged from a five-year funk to turn in two strong quarters of revenue growth and market share gains. The stock has shot up 38% since late July, and Schwartz looked golden while making the rounds of Wall Street and New York customers in early September. "We think Sun is on the way to turning around," says analyst Ben Reitzes of UBS ([UBS](#)), who recently upgraded the

[Get Free RSS Feed >>](#)

### MARKET INFO

DJIA	13870.28	0.00
S&P 500	1540.98	0.00
Nasdaq	2817.44	0.00

## Direct Marketing



x close

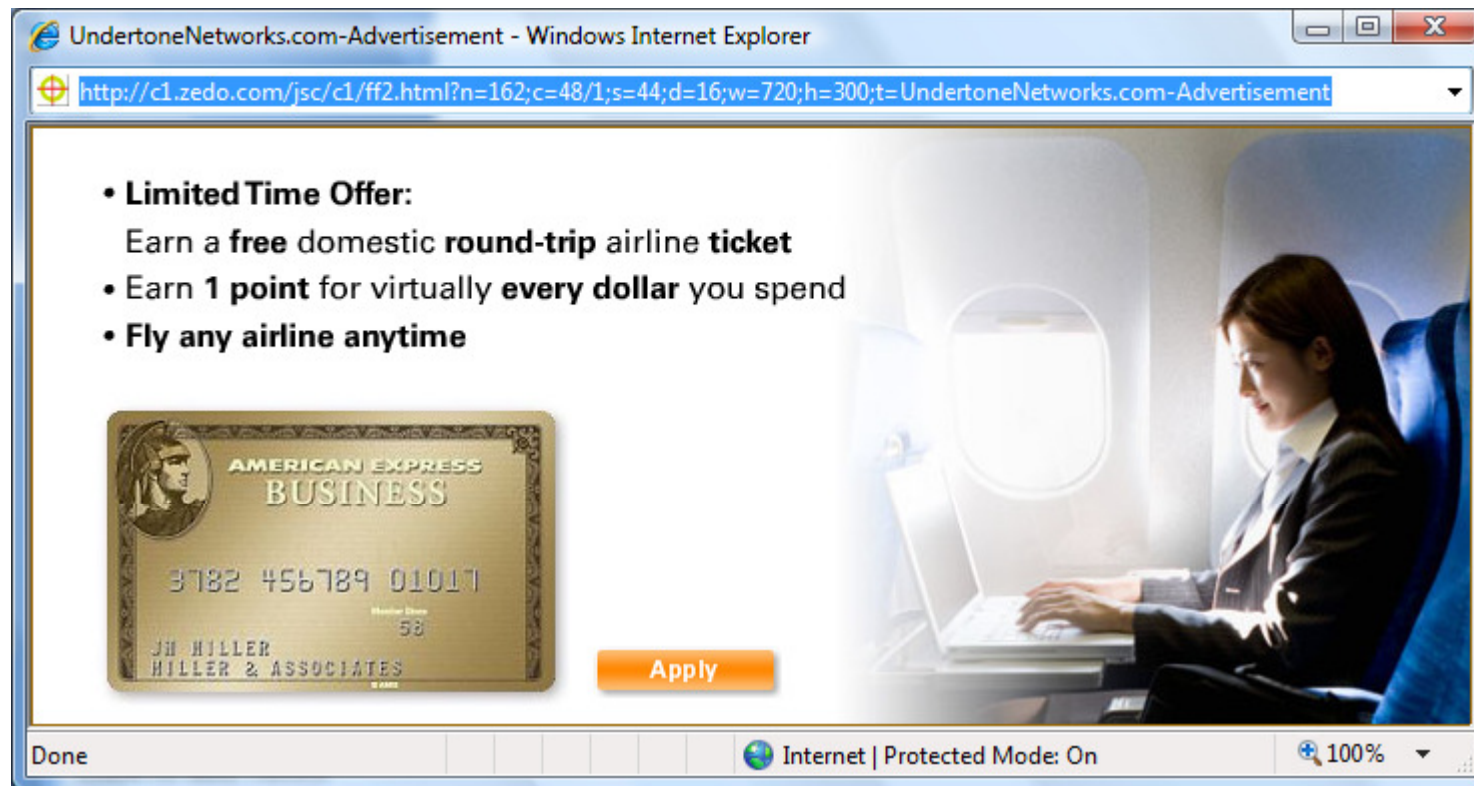
### Your Opinion Matters!

PLEASE TAKE OUR SURVEY.



powered by  
[Safecount.net](#)

# Ad Formats: popunder, image+text



## STATISTICA - Data Mining

Winner of all comparative reviews  
since 1993 - Free Evaluation CD  
[www.StatSoft.com](http://www.StatSoft.com)

# Ad sizes (See IAB)

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IAB Products to Keep You Informed

IAB Products for Your Business

IAB Compliance Seal Program

**Interactive Advertising Bureau (IAB) is comprised of more than 375 leading media and technology companies who are responsible for selling 86% of online advertising in the United States**

NOTE: All dimensions are in pixels.

### Rectangles and Pop-Ups

		Recommended Maximum Initial Download Fileweight	Recommended Animation Length (Seconds)
300 x 250 IMU - (Medium Rectangle)	<a href="#">View IMU</a>	40k	:15
250 x 250 IMU - (Square Pop-Up)	<a href="#">View IMU</a>	40k	:15
240 x 400 IMU - (Vertical Rectangle)	<a href="#">View IMU</a>	40k	:15
336 x 280 IMU - (Large Rectangle)	<a href="#">View IMU</a>	40k	:15
180 x 150 IMU - (Rectangle)	<a href="#">View IMU</a>	40k	:15
<b>*NEW*</b> 300x100 IMU - (3:1 Rectangle)	<a href="#">View IMU</a>	40k	:15
<b>*NEW*</b> 720x300 IMU - (Pop-Under)	<a href="#">View IMU</a>	40k	:15

### Banners and Buttons

468 x 60 IMU - (Full Banner)	<a href="#">View IMU</a>	40k	:15
234 x 60 IMU - (Half Banner)	<a href="#">View IMU</a>	30k	:15
88 x 31 IMU - (Micro Bar)	<a href="#">View IMU</a>	10k	:15
120 x 90 IMU - (Button 1)	<a href="#">View IMU</a>	20k	:15
120 x 60 IMU - (Button 2)	<a href="#">View IMU</a>	20k	:15
120 x 240 IMU - (Vertical Banner)	<a href="#">View IMU</a>	30k	:15
125 x 125 IMU - (Square Button)	<a href="#">View IMU</a>	30k	:15
728 x 90 IMU - (Leaderboard)	<a href="#">View IMU</a>	40k	:15

### Skyscrapers

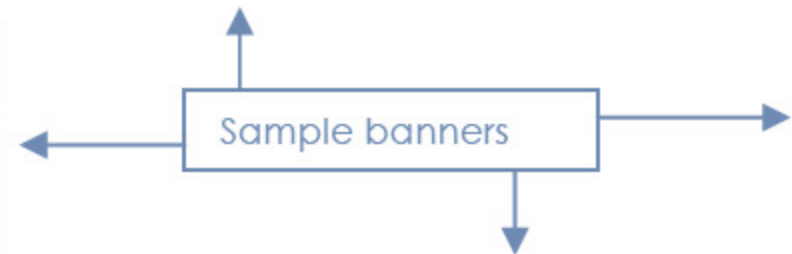
160 x 600 IMU - (Wide Skyscraper)	<a href="#">View IMU</a>	40k	:15
120 x 600 IMU - (Skyscraper)	<a href="#">View IMU</a>	40k	:15

# IAB Standards

# Ads Formats and sizes

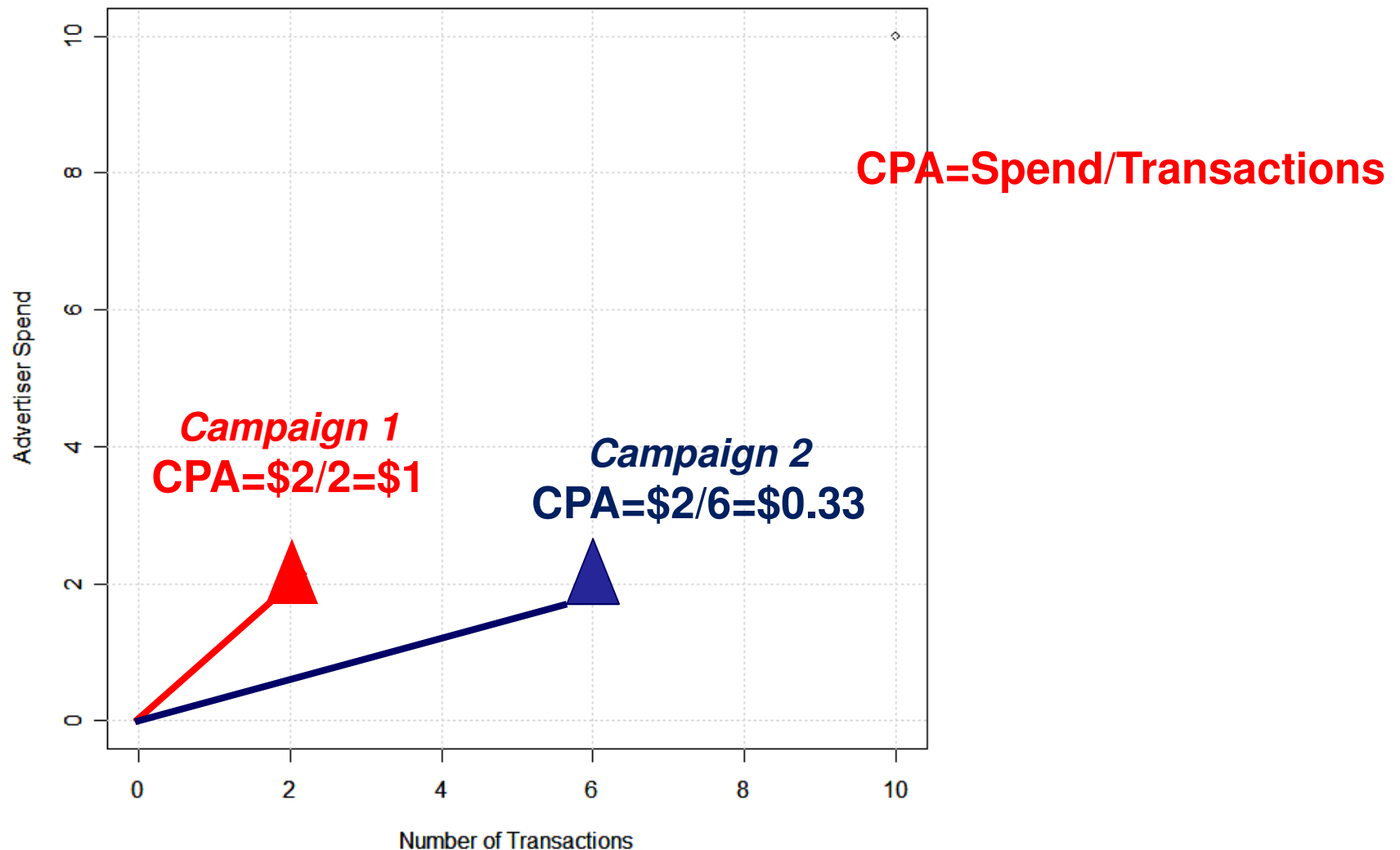
- Text Ads
- Display Ads
  - Graphical, Flash, Rich Media (sound, video)
- Different sizes types:
  - For details see <http://www.iab.net/standards/pdunits/open>
  - Rectangular, R and Buttons
- See IAB for sta

**STATISTICA - Data Mining**  
Winner of all comparative reviews  
since 1993 - Free Evaluation CD  
[www.StatSoft.com](http://www.StatSoft.com)



# Advertising: ROI is King

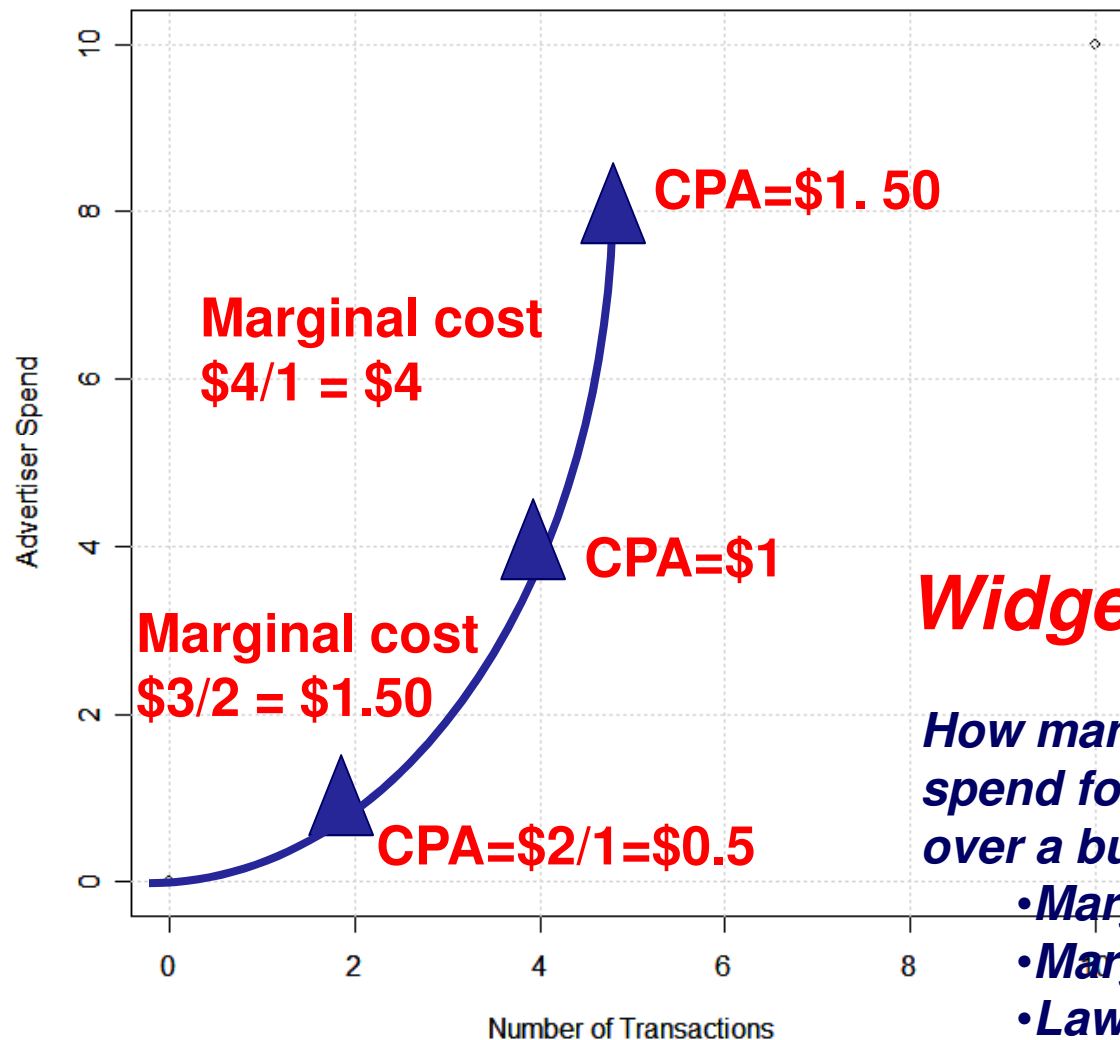
(in French and in Advertising)





# Advertising: ROI is King

(in French and in Advertising)



**Diminishing Returns**  
-Lower Quality Leads  
-Competitive Market  
-Fraud?

**Widget ad budget is \$2**

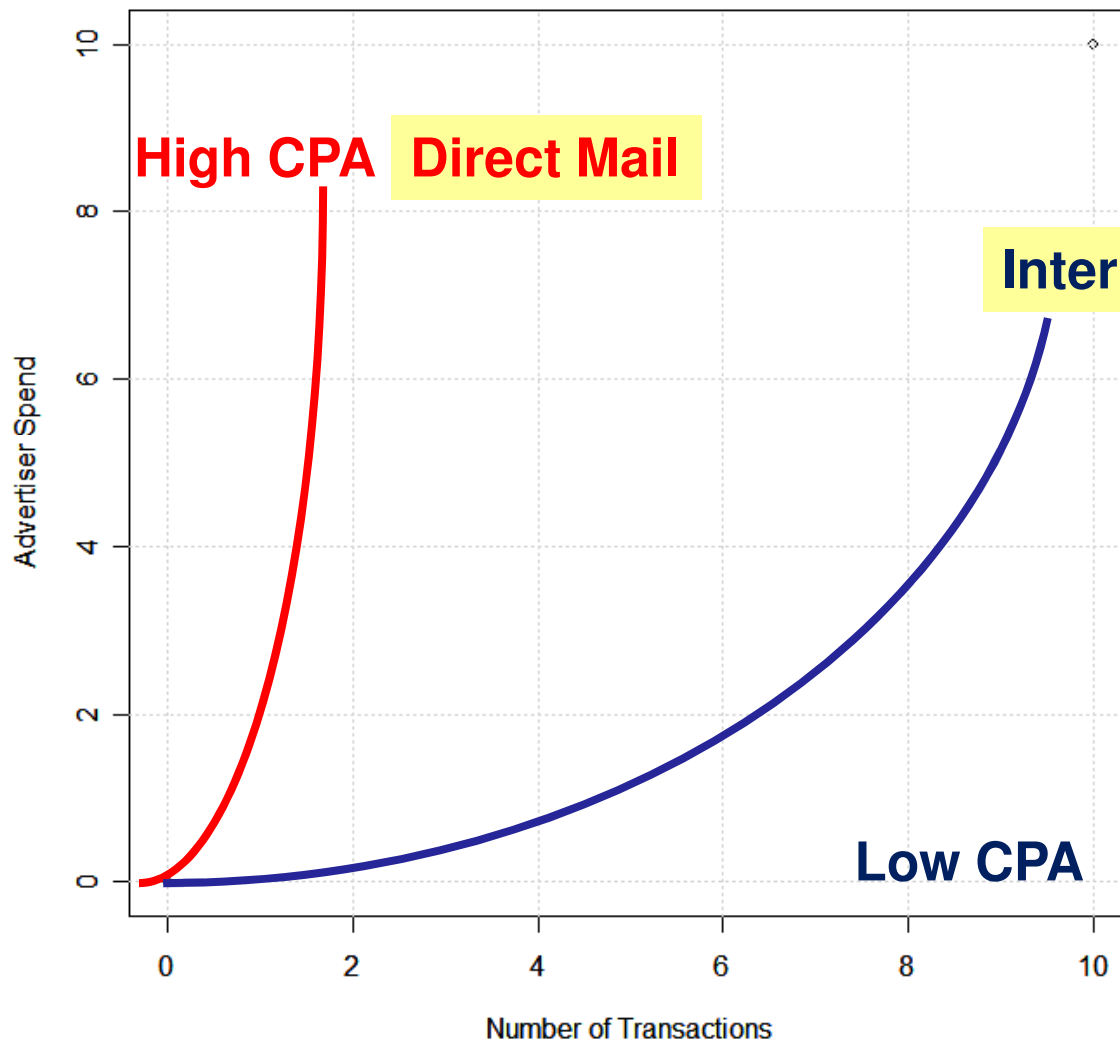
*How many marginal dollars do I spend for each marginal action over a budgeted spend of \$4?*

- Marginal cost of an action
- Marginal utility
- Law of diminishing returns



# Advertising: ROI is King

(in French and in Advertising)



## Poor Performance

### Consumer behavior

- seasonality, time-of-day
- demographics: geo, age, income, etc.

### Advertiser Side

- Creative
- Landing page experience
- Pricing

# Forms of Online Advertising

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- **Advertising online comes in all shapes and sizes and we run into it all the time be through**
  - Websearch
  - reading the newspaper online
  - paying the bills
  - or purchasing a book

# Sponsored Search

Google™   [Advanced Search](#) [Preferences](#)

Personalized based on your web history

Web Books Groups News Scholar Results 1 - 10 of about 491,000,000 for advertising [definition]

**LocalAdLink -Online Power** Sponsored Link  
[www.LocalAdLink.com](http://www.LocalAdLink.com) Advertising at Fraction of the Cost Recruit Agents and Make Big Money

**Advertising** - Wikipedia, the free encyclopedia - 4 visits - 8:08am  
For content guidelines on the use of **advertising** in Wikipedia articles, see Wikipedia:Spam. For a proposal on **advertising** about Wikipedia, ...  
[en.wikipedia.org/wiki/Advertising](http://en.wikipedia.org/wiki/Advertising) - 240k - [Cached](#) - [Similar pages](#) -

**Advertising | Facebook**   
Advertising with Facebook Ads allows you to reach the exact audience you want with relevant targeted advertising.  
[www.facebook.com/advertising/](http://www.facebook.com/advertising/) - 26k - [Cached](#) - [Similar pages](#) -

**platform-a.com | Our Platform puts your brand where life happens.**   
Apr 1, 2009 ... Our platform of trusted AOL brands, quality Advertising.com networks and ...  
Advertising.com's self-service interface for publishers. ...  
[www.platform-a.com/](http://www.platform-a.com/) - 25k - [Cached](#) - [Similar pages](#) -

**Advertising Age is the leading global source of news, intelligence ...**   
Publishers in the advertising field: marketing to consumers, business-to-business, marketing across borders, and the creative world.  
[adage.com/](http://adage.com/) - 57k - [Cached](#) - [Similar pages](#) -

**advertising Tag Page**   
Advertising is a form of communication that attempts to persuade potential customers to purchase a particular brand of product or service. ...  
[technorati.com/r/tag/advertising](http://technorati.com/r/tag/advertising) - 73k - [Cached](#) - [Similar pages](#) -

**Advertising - Advertising Careers and Jobs - Advertising ...**   
Get advertising career help for freelance copywriters and other advertising pros and find insight for businesses needing advertising guidance as well.  
[advertising.about.com/](http://advertising.about.com/) - 31k - [Cached](#) - [Similar pages](#) -

**Google Advertising**   
Allows you to buy advertising on the Google search engine, or on other sites through its AdSense program. Includes a tour and FAQ.  
[www.google.com/intl/en/ads/](http://www.google.com/intl/en/ads/) - 10k - [Cached](#) - [Similar pages](#) -

**Website Advertising**  
Display Your Ad for Free & Pay Only When Customers Respond to Your Ad!  
[adwords.google.com](http://adwords.google.com)

**Marketing & Advertising**  
Web, Print, Lead Generation, SEO Technology & Startup Specialists  
[www.glassCanopy.com](http://www.glassCanopy.com)  
San Francisco-Oakland-San Jose, CA

**Free Online Advertising**  
Get Listed on Major Search Engines with a 30 Day Free Trial. No Risk!  
[www.Yodle.com](http://www.Yodle.com)

**Facebook Advertising**  
Reach the exact audience you want with relevant targeted ads.  
[www.facebook.com/ads/](http://www.facebook.com/ads/)

**Advertise In Your Area**  
Attract Local Customers to Your Business With Direct Advertising!  
[www.valpak.com/advertise](http://www.valpak.com/advertise)  
San Francisco-Oakland-San Jose, CA

**MySpace Advertising**  
Target ads by over 1,100 hobbies & interests. Budgets as low as \$5/day  
[Advertise.Myspace.com](http://Advertise.Myspace.com)

**Buttons, Stickers & More**  
Custom Creations w/your Message Service & Quality you can Count on!  
[www.ELBusaCreations.com](http://www.ELBusaCreations.com)

# Sponsored Search

Also try: [advertising agencies](#), [free advertising](#), [More...](#)

## Need Customers Visiting Your Website? 🖨️

5,000 Free Today Targeted Traffic Guaranteed Sign Ups Email Marketing.

[www.webtrafficus.com](http://www.webtrafficus.com)

## Online Advertising System

Get All-in-One Online Advertising. 1000s of Big Companies Trust Us.

[www.Lyris.com](http://www.Lyris.com)

## Free Online Advertising

Find and Compare prices on free online advertising at Smarter.com.

[www.smarter.com](http://www.smarter.com)

## Advertising For Free

Find Local Advertising For Free. Post free classifieds at Kijiji.

[www.Kijiji.com](http://www.Kijiji.com)

## Advertising - Wikipedia, the free encyclopedia

[History](#) | [Types of advertising](#) | [Criticism of advertising](#) | [Regulation](#)

**Advertising** is a form of communication that typically attempts to persuade potential customers to purchase or to consume more of a particular brand of product or service. "While now central to the contemporary global economy and the reproduction of global production...

[en.wikipedia.org/wiki/Advertising](http://en.wikipedia.org/wiki/Advertising) - 240k - [Cached](#)

## advertising: Definition, Synonyms from Answers.com

**advertising** n. The activity of attracting public attention to a product or business, as by paid announcements in the print, broadcast, or electronic

[www.answers.com/topic/advertising](http://www.answers.com/topic/advertising) - 376k - [Cached](#)

## Advertising - How To Information - eHow.com

Research basic advertising concepts and advanced strategies, from choosing an agency to do-it-yourself online advertising. With eHow, get tips on finding cheap and...

SPONSOR RESULTS

SPONSOR RESULTS

## Free Internet Advertising

Special: Get 2,000 FREE Visitors. Advertise online. FREE Trial.

[www.engineseeker.com](http://www.engineseeker.com)

## Free Email Advertising

Looking for Email Advertising?

Your Small Business Hub.

[Advertising.Capital.com](http://Advertising.Capital.com)

## Advertising Online

#1 Ranked Internet Advertising Firm, Results in 24hrs. 30% off Today.

[www.wpromote.com](http://www.wpromote.com)

## Online Advertising

Cost Effective Way to Optimize Your Online Business! Watch Video.

[www.prweb.com](http://www.prweb.com)

## Free Ads & Sales Leads

For Any Business & Any Profession +10,000 Free Reports & Membership.

[ZanaNetwork.com](http://ZanaNetwork.com)

# Contextual Advertising

Text vs Graphical Ad

enjoy!  
[www.whitesandresort.com](http://www.whitesandresort.com)

## Phan Thiet Hotels

Find the lowest price on great hotels. Book Now!  
[PhanThiet.OneTime.com](http://PhanThiet.OneTime.com)

## Kiteboarding clearance

Kitesurf instruction, tricks and tips from a professional, online!  
[www.kitesurfinginformatic.com](http://www.kitesurfinginformatic.com)

Ads by Google

## Best Kiteboarding

Low Prices from the World's Largest Kiteboarding Company  
[www.bestkiteboarding.cc](http://www.bestkiteboarding.cc)

or local children drowning.

The yearly [Le Fruit Triathlon](#) is held in Mui Ne on June 1, and includes swimming, running and mountain biking.

## Surfing

Mui Ne offers a relatively safe environment for low-key surfing. (see [kiteboarding](#) below).

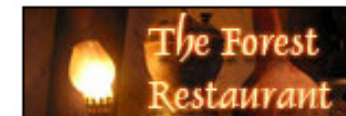
## Scuba Diving and Snorkeling

The Best diving in [Binh Thuan](#) Province (or all of Vietnam for that matter) is at Ca Na Beach. The water is clear, the coral reefs are pristine, and the whole area is bursting with marine life. One thing Ca Na is lacking is very many tourists and the resorts to contain them. [Vietnam Scuba](#) has a very "for Koreans, by Koreans" diving establishment there. The website has some English, but we have not confirmed if anyone on staff speaks English fluently. [Click here](#) to read more about the [scuba diving](#) potentials at Ca Na Beach and the Hon Cau-Vinh Hao Proposed Marine Protected Area. Though all but undiscovered, [Phu Quy Island Proposed Marine Protected Area](#) also has (but be

From tir

east of Binh Thuan Province. In the summer of 2004, three tonnes

S.T.K. CENTER  
KITESURFING &  
WINDSURFING



[The Ultimate Book of Power Kiting and Kiteboarding](#)

Jeremy Boyce

Best Price \$8.00  
or Buy New \$13.57

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For standards see IAB

<http://www.iab.net/standards/adunits.asp>



# House Ads....

Apply for an American Express® Card – Get a Decision in 60 Seconds - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://www201.americanexpress.com/sbsapp/FMACServlet?request\_type=alternateChannels&lpid=246&ccsgeep=425t

Most Visited Getting Started Latest Headlines MIT's Introduction to ... Speedtest.net - Results Hillier lieberman .Pdf E... Mike On Ads >>> Speakeasy - Speed Test

Google Search

HOME PERSONAL CARDS TRAVEL SMALL BUSINESS CORPORATIONS MERCHANTS

Global Sites | Help | Contact Us | Log Out


Need Help? SEARCH VIEW ACCOUNTS

## AMERICAN EXPRESS

### GET A DECISION IN 60 SECONDS

Personal Cards Business Cards


Find the card that's right for you



**REWARDS PLUS GOLD CARD**

- Earn up to \$150 in Gift Cards redeemable at participating retail, dining, and entertainment partners
- Earn one point for virtually every dollar you spend on the Card
- Earn double points on travel for your first year; 1.5 points per eligible dollar thereafter
- Double points on gas and groceries for your first year; 1 point per eligible dollar thereafter


APPLY NOW



**BLUE FROM AMERICAN EXPRESS®**

- Receive 0% intro APR for up to 12 months
- Redeem points for retail, dining, travel and entertainment easily with the Membership Rewards Express® program
- Gain independence with flexible payment options and no annual fee

APPLY NOW



**GOLD DELTA SKYMILES® CREDIT CARD**

- Earn 20,000 bonus miles upon your first purchase with the Card
- Earn 5,000 bonus miles when you sign up for two Additional Cards
- Earn one mile for virtually every dollar you spend

APPLY NOW

# House Ads....

Hello, James Shanahan. We have [recommendations](#) for you. (Not James?)

James's Amazon.com [Today's Deals](#) [Gifts & Wish Lists](#) [Gift Cards](#) [Your Account](#) | [Help](#)

Search  [GO](#) [Cart](#) [Your Lists](#)

**Shop All Departments**

- Books
- Movies, Music & Games
- Digital Downloads
- Kindle
- Computers & Office
- Electronics
- Home & Garden
- Grocery, Health & Beauty
- Toys, Kids & Baby
- Apparel, Shoes & Jewelry
- Sports & Outdoors
- Tools, Auto & Industrial

**Kindle 2 Has Arrived**

Sleeker design. More storage. Longer battery life. Choose from over 265,000 books all available in under 60 seconds. And now Kindle can read to you. Our revolutionary wireless reading device just got better.

[Learn more](#)

**amazonkindle**

**Amazon Daily BLOG** 10 posts since yesterday [Posts for James](#)

**Introducing the Latest Pen from Sharpie**

Get this new [Sharpie marker](#) featuring a sleek, stainless steel design.

[Learn more](#)

**Digital SLR Store**

Find Top Digital SLRs, Lenses, Buying Guides, and More

[Shop Amazon.com/dslr](#)

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Download tax software directly to your PC.
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Enter for a chance to win by April 22.
- Amazon BlackBerry App**  
Shop directly from your BlackBerry.
- New from Flip Video**  
New Mino and MinoHD designs.
- Selling on Amazon**  
List items for free and sell to millions.

**More to Explore**

You looked at

**Repeated Games and Reputations...** Hardcover by George J. Mailath, Larry Samuelson  
~~\$59.99~~ **\$45.16**  
[Find similar items](#)

You might also consider

**Putting Auction Theory to Work** Paperback by Paul Milgrom  
~~\$38.00~~ **\$35.09**

**The Theory of Industrial Organization** Hardcover by Jean Tirole  
~~\$72.00~~ **\$55.75**

**Frequently Bought Together**

When customers buy **Repeated Games and Reputations...** 100% buy it with **Putting Auction Theory to Work** 40% buy it with **The Theory of Industrial Organization**

**A Mosaic of Tiles**

Whether it's the focal point or just a backdrop, [tile](#) can define areas, distinguish style, and add pizzazz to your kitchen or bathroom.

[Shop for tiles now](#)



## OA is cavalier! : business models; ad placement; e:b wants to be online



js.com/I AM BETTER THAN YOU AND I AM FILTHY RICH--I AM A JERK/

***RuSSIR 2009, Petrozavodsk, Russia. Online Advertising © 2009 James G. Shanahan (San Francisco)***

**James.Shanahan AT gmail DOT com**



## E.g., Business Model CIKM 2008

CIKM 2008 | Home - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://cikm2008.org/

Getting Started Latest Headlines AddThis Social Bookm... Outlook Web Access Wireless Security iKitesurf.com - 3rd Av...

Google Behavioral Targeting: Advert Search PageRank AutoLink AutoFill Settings

Chase On... Gmail - In... restaURA... Microsoft... Does Micr... Behaviora... July 2007 ... CIKM ...

# CIKM Napa Valley 2008

ACM 17th Conference on Information and Knowledge Management Napa Valley Marriott Hotel & Spa: Napa Valley, California October 26-30, 2008

### Participants

- Home
- News
- Themes
- Important Dates
- Registration
- Student Travel

### Program

- Schedule
- Keynote Speakers
- Workshops
- Industry Event
- Publicity

### Contributors

- Call for Papers
- Call for Tutorials
- Call for Workshops
- Call for Sponsorship
- How to Submit

### Location

- Conference Site
- Accommodation
- Napa Valley
- Travel

### About Us

- Organizers
- History

### News Updates

- 2008-05-13 Industry Event at CIKM 2008
- 2008-05-13 Accepted Workshops Published
- 2008-04-25 Subscribe to our RSS feed
- 2008-04-22 Confirmed Keynote Speaker: Rakesh Agrawal
- 2008-04-04 Confirmed Keynote Speaker: Pedro Domingos

### Submission dates for research and industry papers

- Abstracts due: May 27, 2008 **Closed**
- Papers due: June 2, 2008 **Closed**
- Workshop Papers due: See Individual Workshops Calls
- Tutorial Proposals due: July 15, 2008

CIKM 2008 will take place at the Napa Valley Marriott Hotel & Spa, 3425 Solano Avenue, Napa, CA 94558. This is right in the center of beautiful wine country - north of San Francisco and about 50 minutes by car/bus/limo.

Since 1992, the ACM Conference on Information and Knowledge Management (CIKM) has successfully brought together leading researchers and developers from the database, information retrieval, and knowledge management communities. The purpose of the conference is to identify challenging problems facing the development of future knowledge and information systems, and to shape future research directions through the publication of high quality, applied and theoretical research findings. In CIKM 2008, we will continue the tradition of promoting collaboration among multiple areas. We encourage submissions of high quality papers on all topics in the general areas of databases, information retrieval, and knowledge management. Papers that bridge across these areas are of special interest and will be considered for a "Best Interdisciplinary Paper" award.

As CIKM 2008 will be held in Napa Valley, just one hour to the north of San Francisco, one of the goals of the conference is to embrace the innovative spirit of the Bay Area/Silicon Valley in bidding further the

### Gold Supporters

- IRF
- Microsoft
- searchme

### Silver Supporters

- Advertising.com
- Ask.com
- eBay Research Labs

Find: Next Previous Highlight all Match case

Done

# Bad Ad Placement? Moral Conscience



[Source: Neatorama.com]

[Source: [www.livingsweb.com](http://www.livingsweb.com)]

# Bad Ad Placement?

---



[ [back to Breaking News index](#) ]

**Leverage sentiment to avoid?**  
**[Shanahan et al., AAAI Symposium 2005]**

## One toddler dead, another critical after house fire

Source: AAP|Published: Friday June 29, 11:17 AM

A baby has been killed and a toddler critically injured in a house fire in Perth.

The 15-month-old boy died in the fire, and his two-year-old brother is now in intensive care in the Princess Margaret Hospital.

Police say they're still investigating the cause of the blaze, that broke out around 7pm (WST) last night.

But they say it may have started from an open fire.

**[Source: LivingWeb.com]**



# A Bitter-Sweet Advertising Moment!



## Web

### Steve Irwin Dead

[www.ebay.co.uk](http://www.ebay.co.uk)

Find **Steve Irwin Dead!** Buy **Steve Irwin Dead** on eBay

News results for **irwin steve dead** - [View today's top stories](#)



[Great croc hunter salutes Irwin](#) - News24 - 5 hours ago

[Close friend explains the circumstances of Steve's death](#) - ABC Online - 10 hours ago

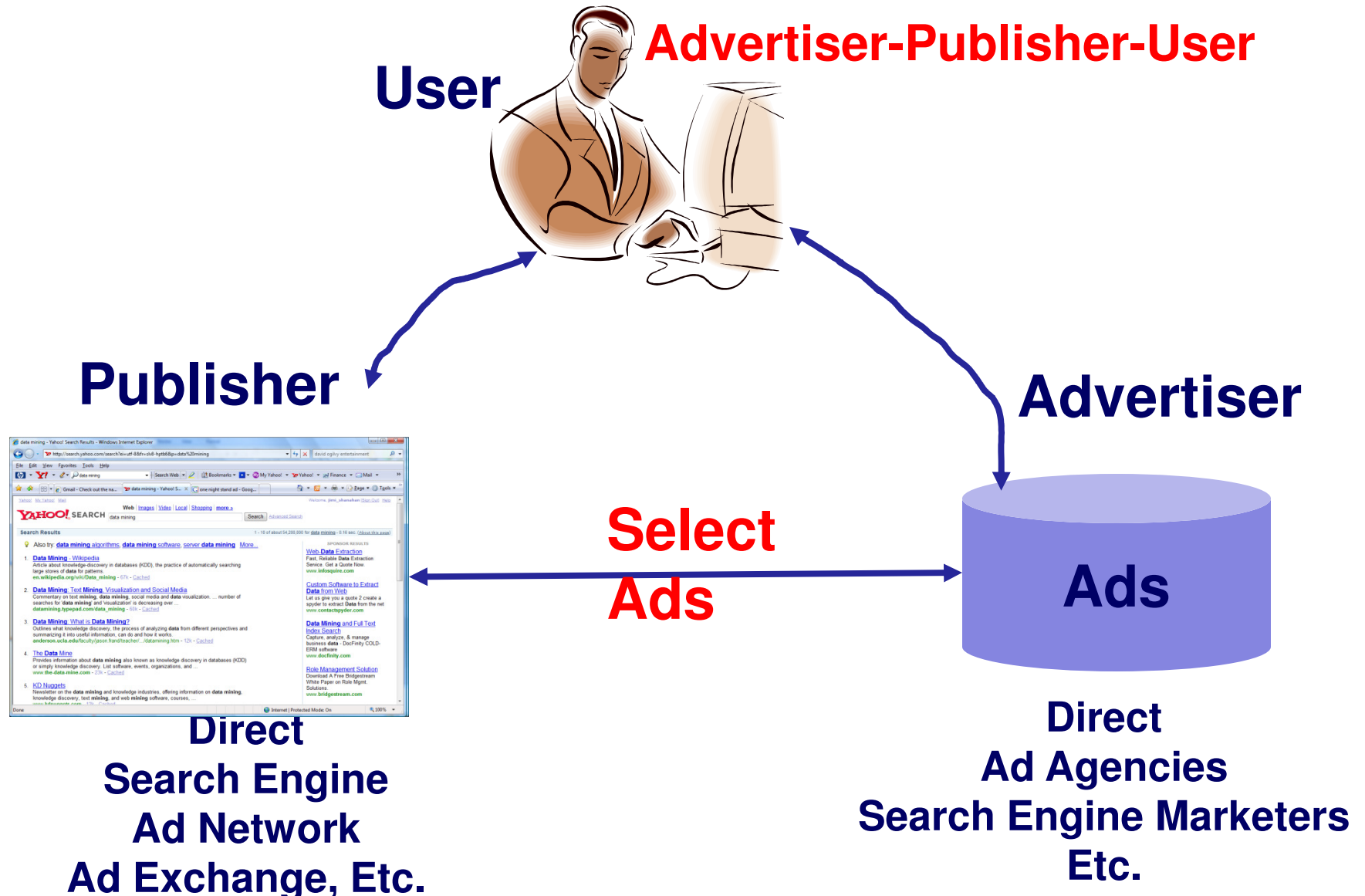
[Croc Hunter Steve Irwin dead in accident](#) - The Age - 12 hours ago

# Outline

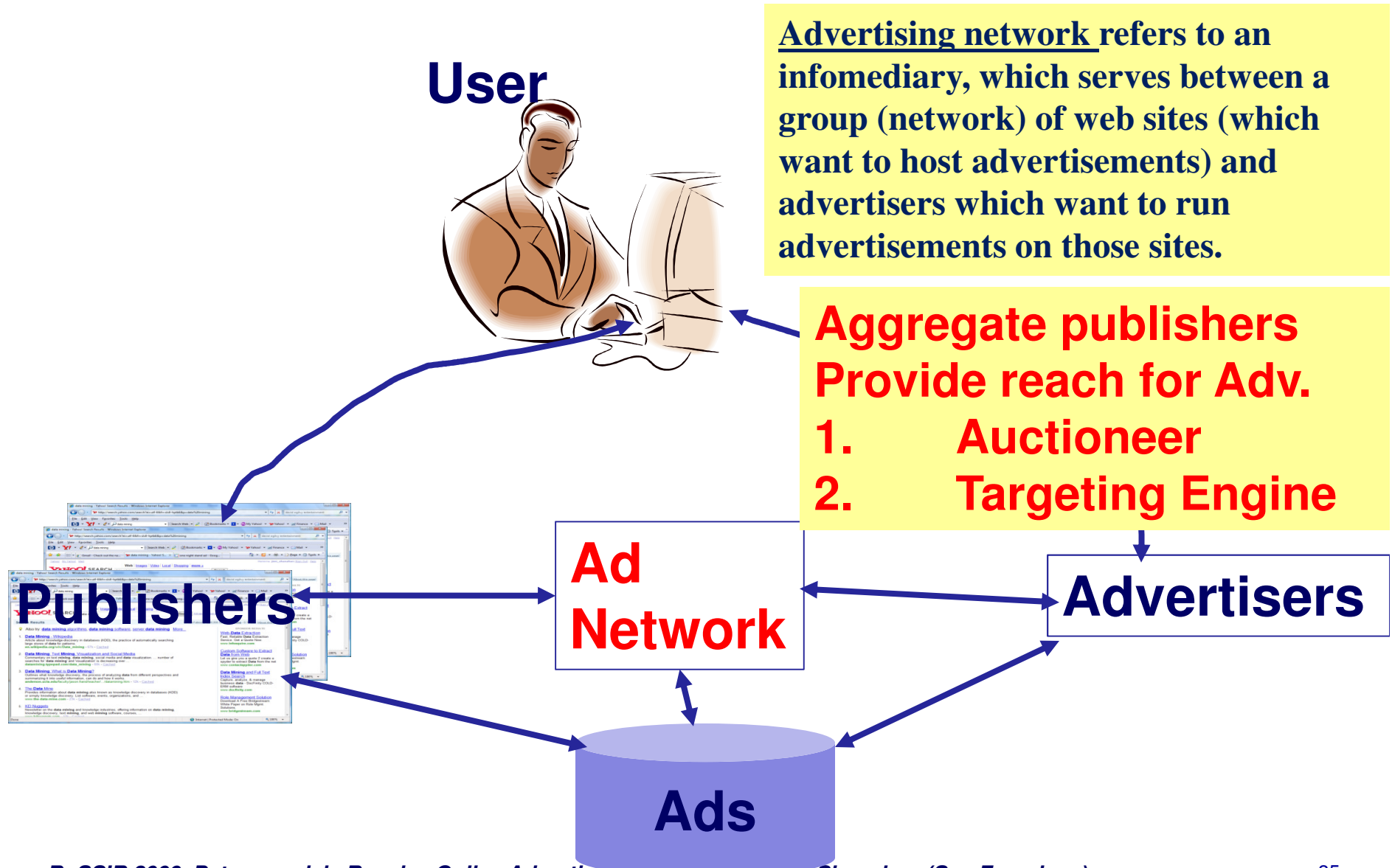
---

- Introduction
- Online advertising background
- Business models
- Creating an online ad campaign
- Technology and Economics
- New Directions
- Challenges in online advertising
- Summary

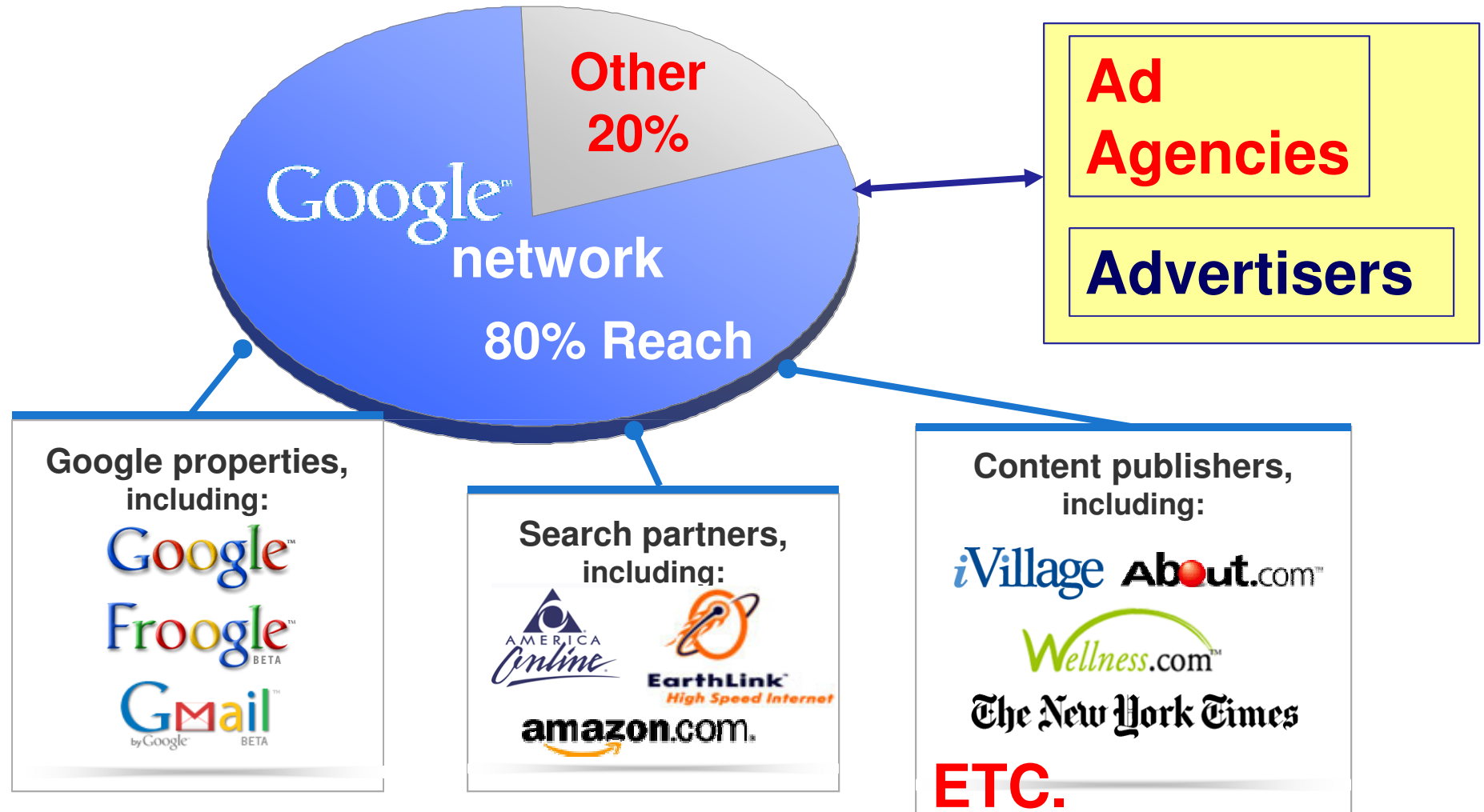
# Online Advertising



# Online Advertising



# Example Ad Networks [2004]

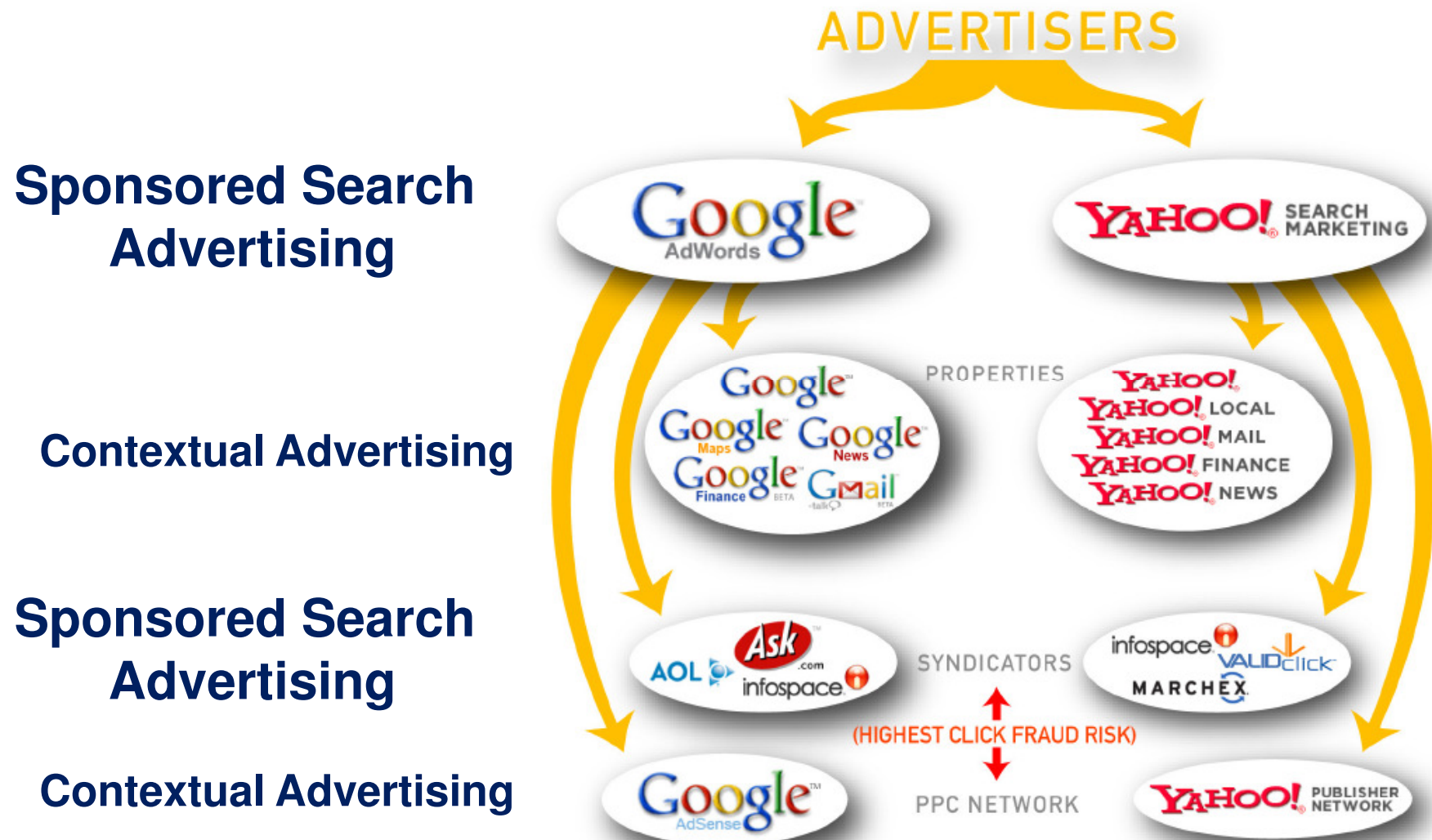


- The Google Network consists of Google sites & partner properties that use Google AdSense to serve AdWords ads

\* Adapted: comScore Media Metrix (September, 2004)



# Yahoo and Google Ad Networks



[Adapted from Think Partnership, 2007]

RuSSIR 2009, Petrozavodsk, Russia. Online Advertising © 2009 James G. Shanahan (San Francisco)

James.Shanahan\_AT\_gmail\_DOT\_com

# As a publisher I can sell ...

---

- **As a publisher (e.g., NYTimes, Google, MS)**
  - Sell my inventory directly; let advertiser's (or advertiser surrogates) reserve with guaranteed payments [Premium pricing]
  - Remnant inventory; Low-cost advertising space that can be relatively undesirable or otherwise unsold (usually sell as revenue share)
- **Via Ad networks (e.g., Google, Yahoo.com, Turn.com)**
  - Arbitrage and remnant;
  - Media aggregators and advertiser aggregators with targeting and auction mechanism
- **Via Ad Exchanges (e.g., RightMedia.com, AdECN)**
  - Remnant; Media aggregators with auction and primitive exclusion policies (e.g., no alcohol ads, may provide category of page/site)
- **Publisher-side Optimization networks (Yield Managers)**
  - Work directly with publishers; E.g., Pubmatic, Rubicon, AddKick
  - Select advertiser/network that offers best revenue

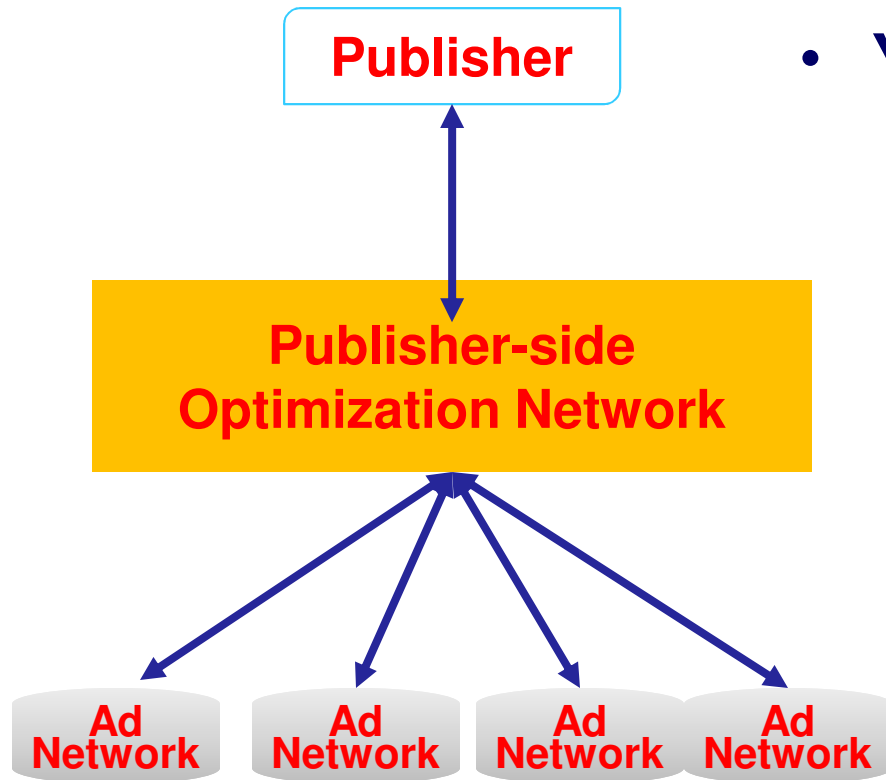
# Yield Management

---

- Yield management, also known as revenue management
- The process of understanding, anticipating and influencing consumer behavior in order to maximize revenue or profits from a fixed, perishable resource
  - such as airline seats or hotel room reservations;
- The challenge is to sell the right resources to the right customer at the right time for the right price.
- This process can result in price discrimination, where a firm charges customers consuming otherwise identical goods or services a different price for doing so
  - Airline ticket: refundable; change fees; Saturday night stay

[Wikipedia.org]

# Publisher-side Optimization Networks



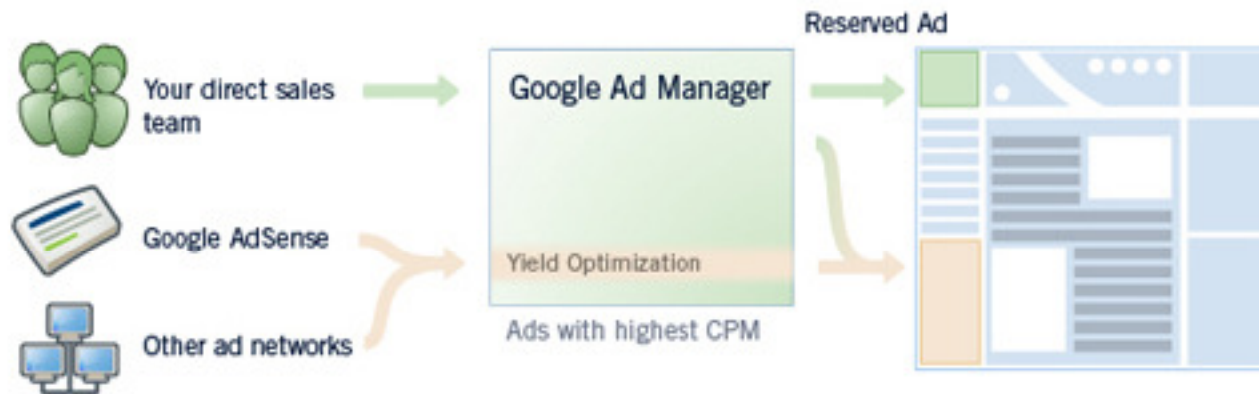
- **Yield Management Systems**

- Similar to airline industry software for pricing tickets and keeping track of available seats
- *It forecasts how much a publisher can get for ad placements, and whether they should sell the spots themselves or use ad networks*
- *Provides online ad analytics e.g., Rapt acquired by Microsoft in 3/2008*
- Can simplify ad network management by giving publishers one set of ad tags (html code) and one integrated reporting interface across multiple ad networks.

# Google Ad Manager

---

**Me: the publisher**



Google Ad Manager delivers all of your directly-sold and network-based inventory

---

**Via DoubleClick**

# Yield mat. example: Publisher-side

Rubicon Video | Internet Advertising - the Rubicon Project - Mozilla Firefox

http://rubiconproject.com/files/flash/flash.php

BETA | Logged in as: demo2 MY ACCOUNT ? HELP LOGOUT

**rubicon** PROJECT

SITES NETWORKS REPORTS

My Sites

Search:  Add

Rubicon Demo  
http://www.rubiconproject.com  
4 zone(s)  
Leaderboard (728x90)...more  
Active

Site Setup

About Your Site Ad Sizes Zones Ad Quality Audience User Data

a few basic questions about your site...

What is your Site's Name?

What is your Site's URL?  
  
[I have more URLs...](#)

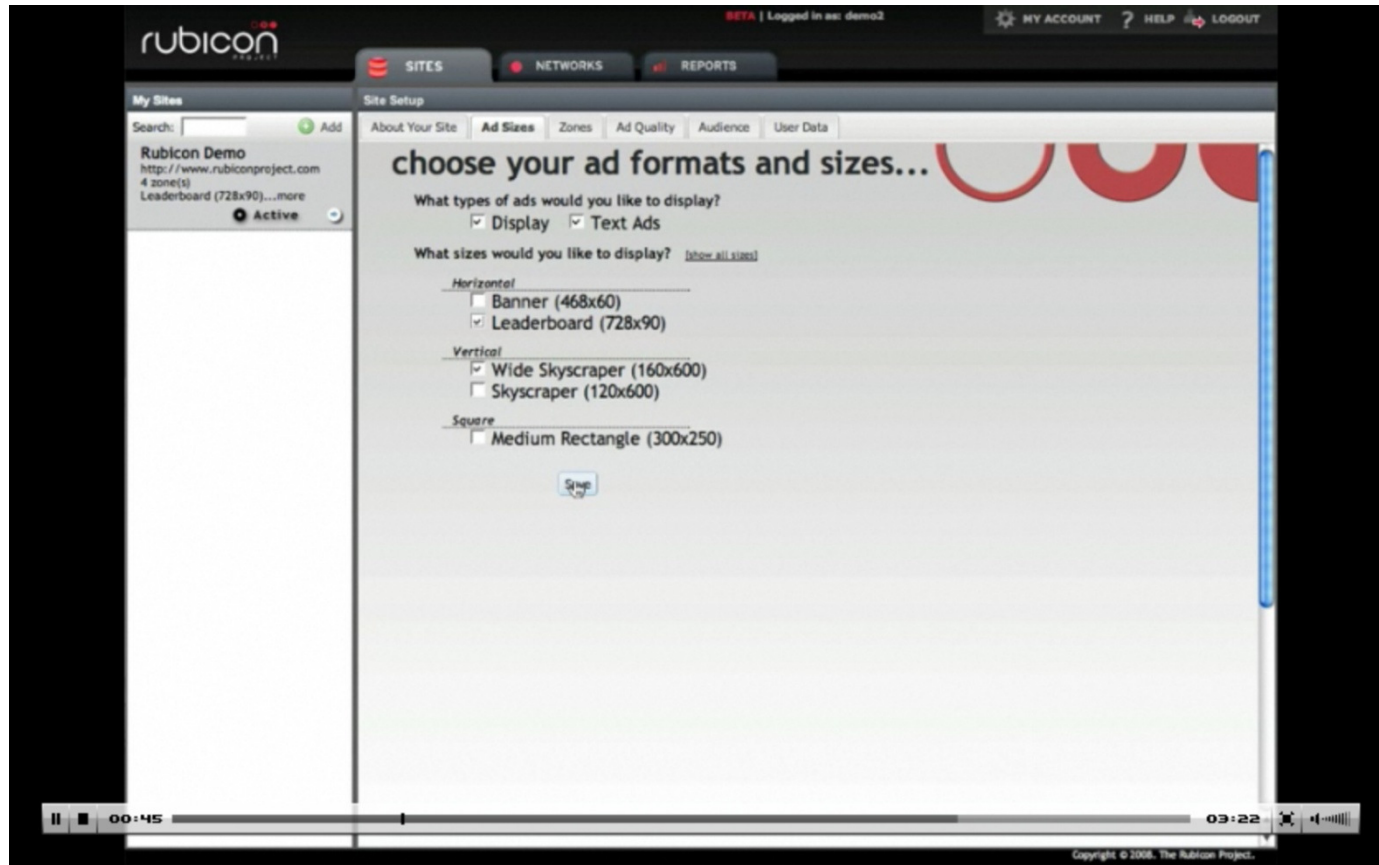
What's the content focus of your Site?

What type of Site is this?

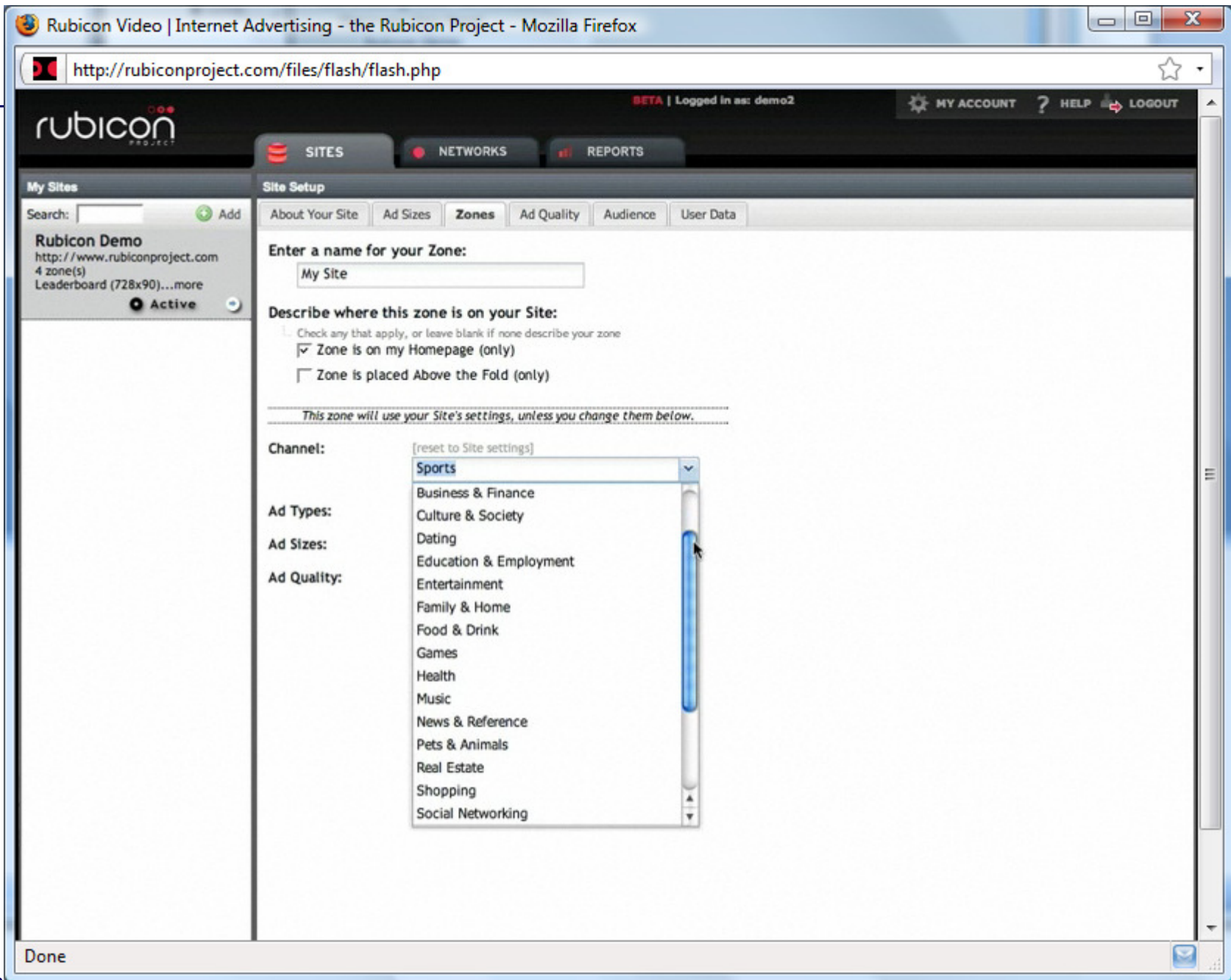
Save

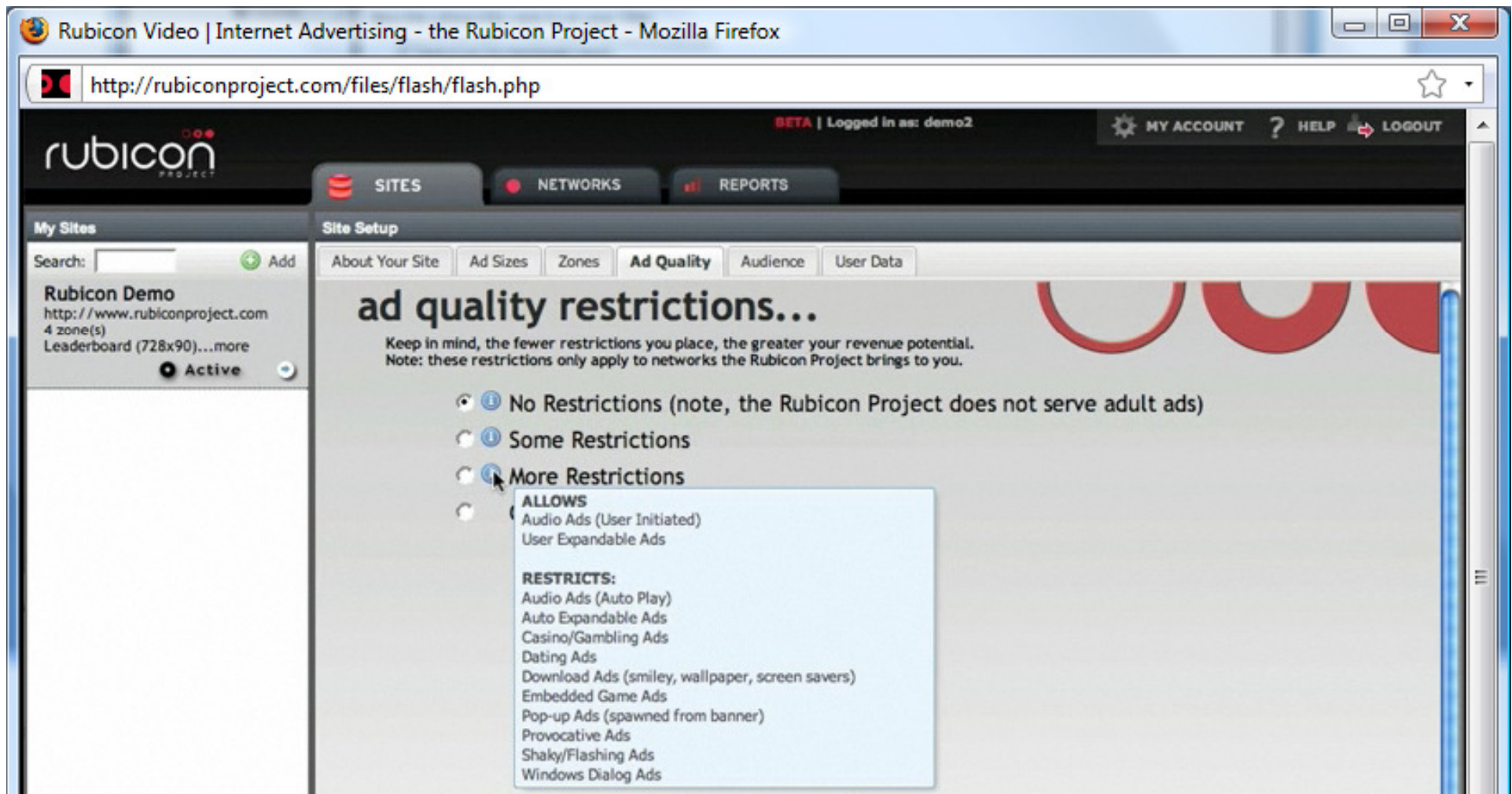


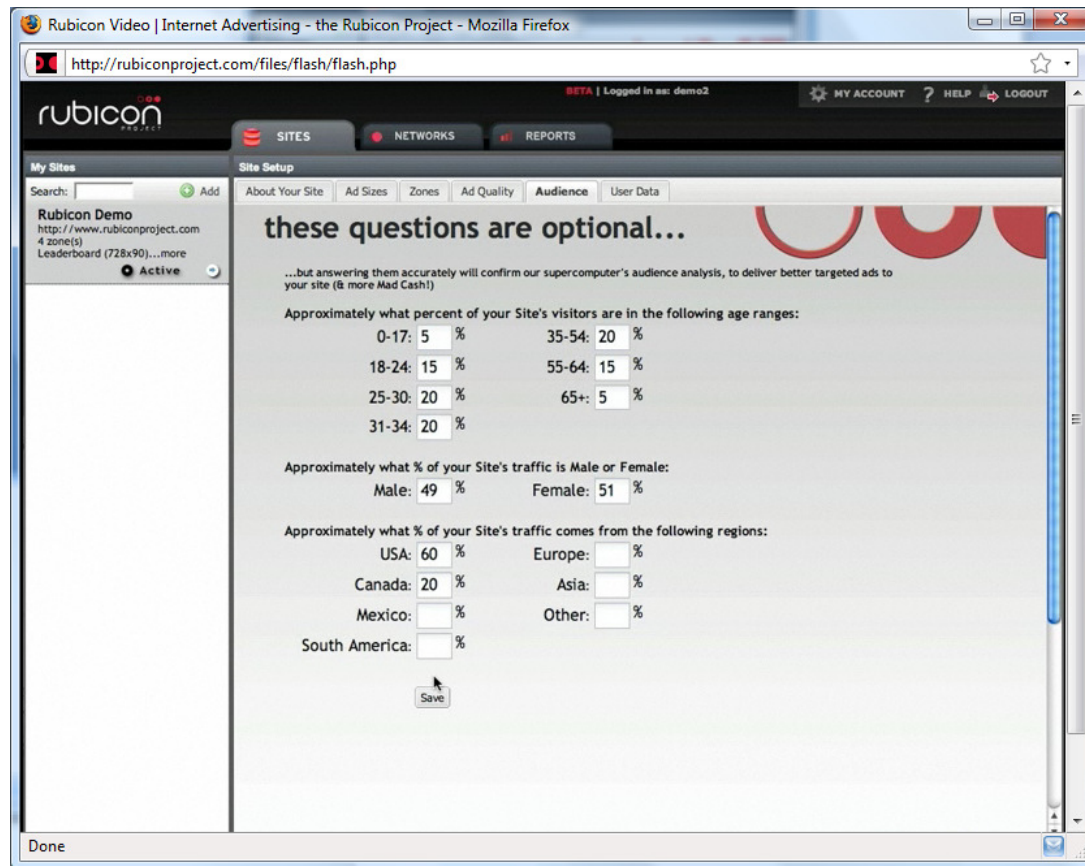
# Yield mgt. example: Publisher-side













# Paste Ad Code ...

The screenshot displays the Search Engine Roundtable website. On the left, a sidebar contains navigation links: Home, Authors, OUR Forums, THE Forums, Archives, and More Info. Below these are premium sponsor advertisements for Guaranteed Rankings.com (offering SEO services) and links (describing themselves as an in-content ad leader). The main content area is titled 'Search Engine Roundtable Forums' and includes links for Register, FAQ, and Members List. A welcome message follows, advising new visitors to check the FAQ and select a forum. A table lists several forums: Google Roundtable (9 viewing), Yahoo! Roundtable, MSN Roundtable (2 viewing), and Ask Jeeves Roundtable (1 viewing). Each forum entry includes a brief description and a list of sub-forums.

**SEARCH ENGINE ROUNDTABLE**

Home Authors  
OUR Forums THE Forums  
Archives More Info

PREMIUM SPONSORS + advertise

**Guaranteed Rankings.com**  
-----800.661.0387-----  
**Guaranteed SEO:**  
You don't pay us until we get your website ranked on Google's 1st page (top 10 rank)

**links**  
The In-Content Ad Leader.  
Bloggers: **Make Cash.**  
SEO's: **Rank Higher.**  
**GET STARTED**

**200 million passionate people**  
If they have passion for it you'll find them here.

**Facebook Ads**  
**Get Started ▶**

**ALL OUT ON THE TABLE**

**SEM FORUM THREADS**

▶ **Cre8asite Forums**  
New Website

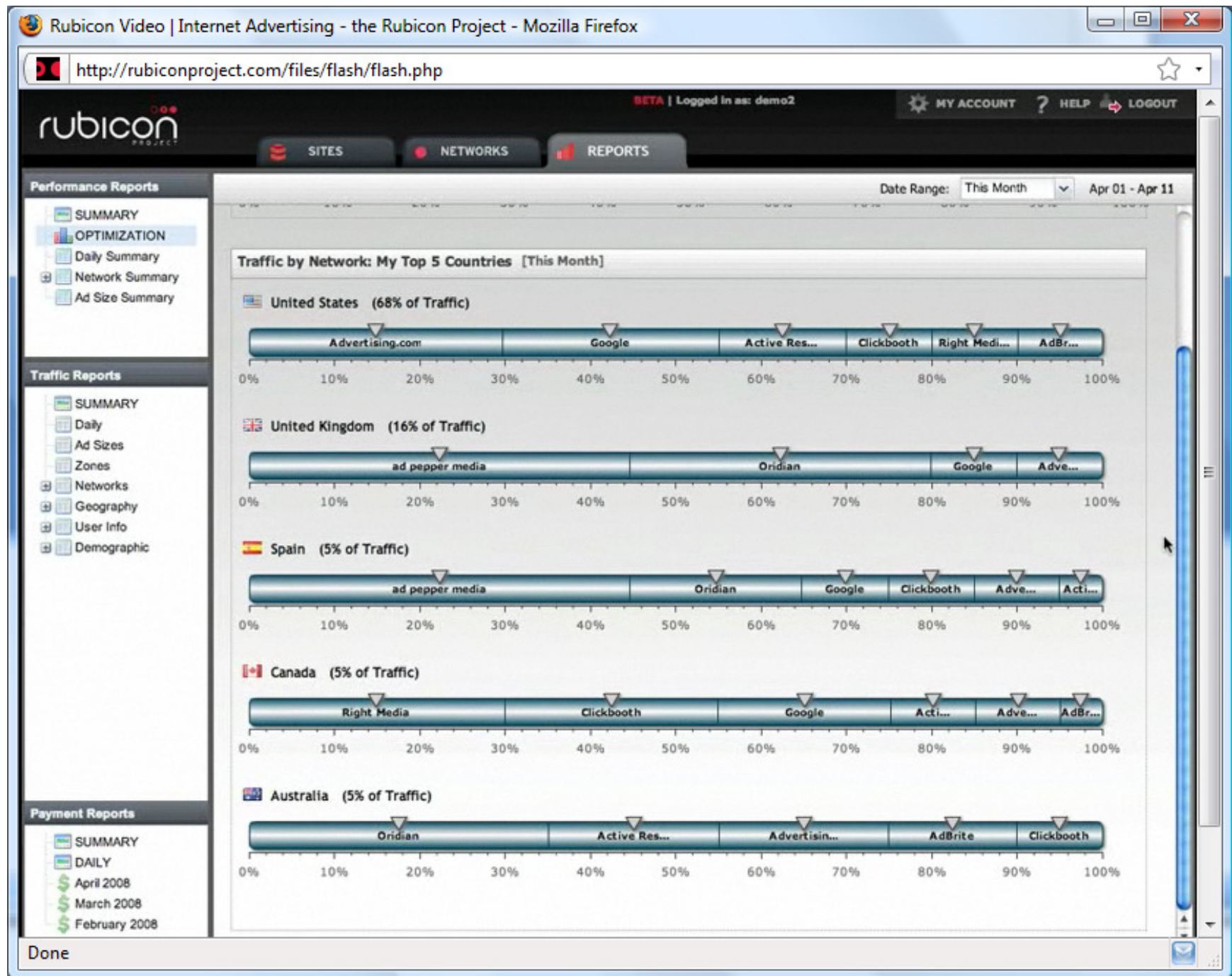
**Search Engine Roundtable Forums**

Register FAQ Members List

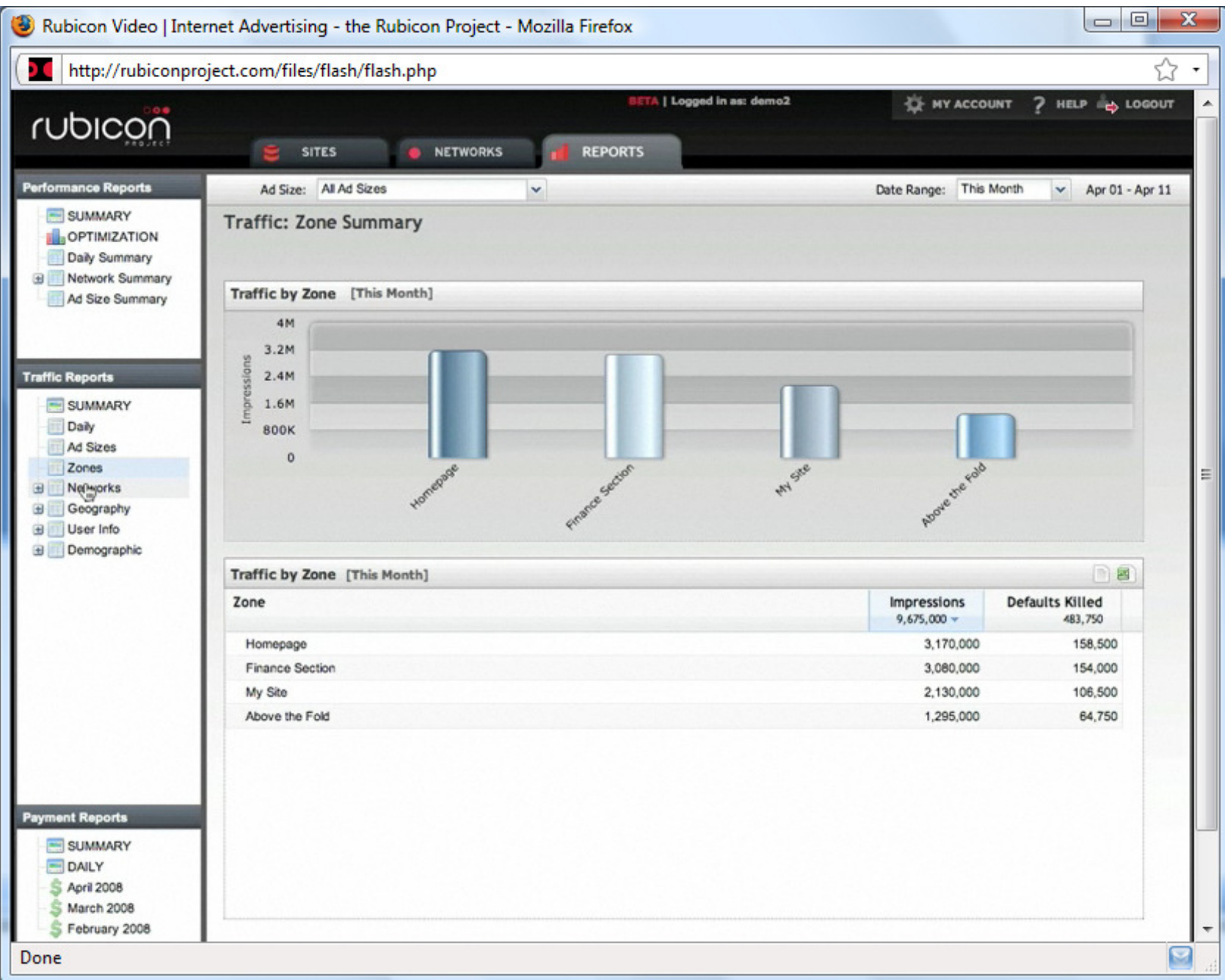
**Welcome to the Search Engine Roundtable Forums.**

If this is your first visit, be sure to check out the [FAQ](#) by clicking the link above. viewing messages, select the forum that you want to visit from the selection below

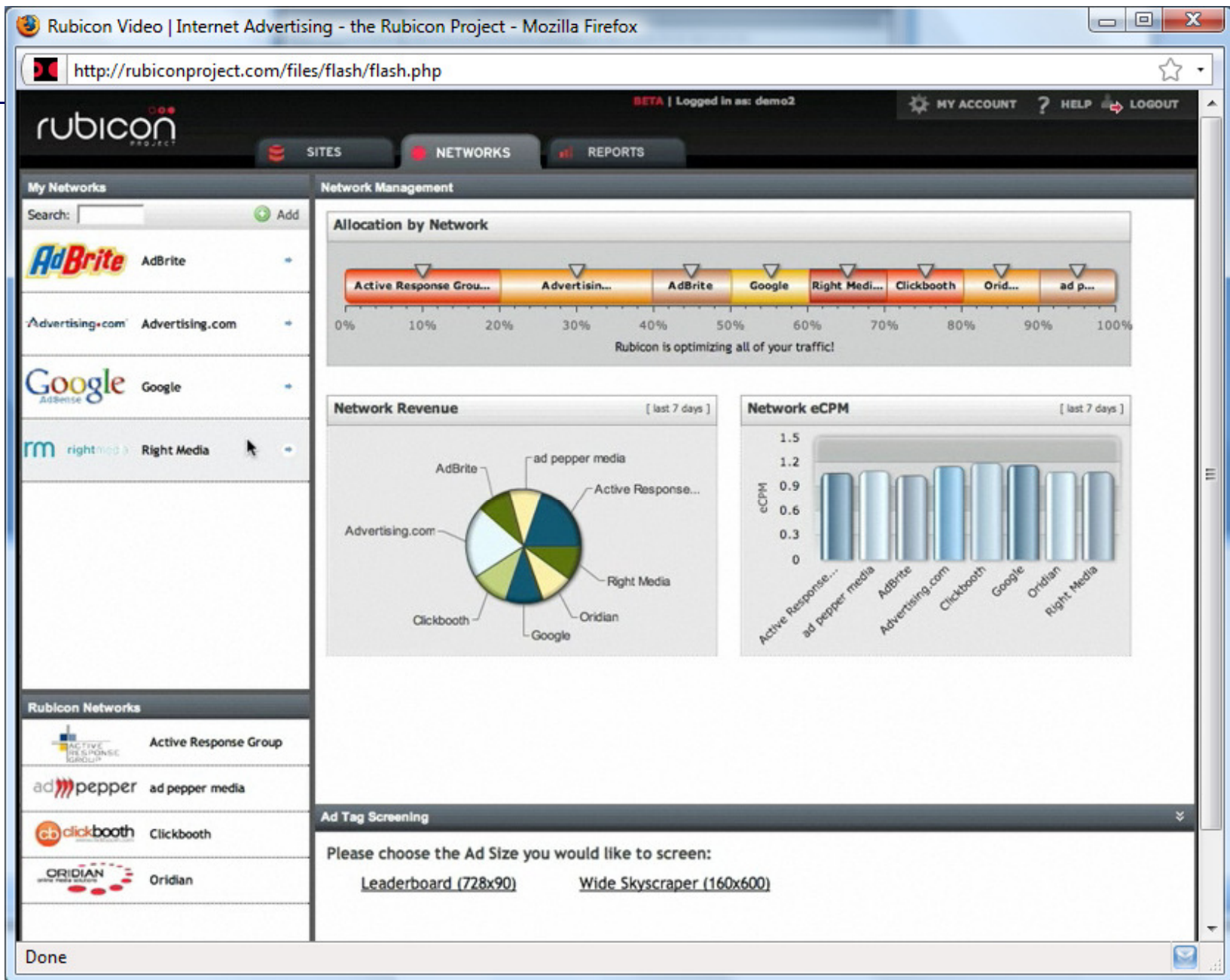
	Forum
<b>Search Engines Forums</b> Talk about specific search engines.	
	<b>Google Roundtable</b> (9 Viewing) The <a href="#">Google</a> Roundtable Forums. <b>Sub-Forums:</b> <a href="#">Google Web Search</a> , <a href="#">Google AdWords</a> , <a href="#">Google AdSense</a> ,
	<b>Yahoo! Roundtable</b> The <a href="#">Yahoo!</a> Roundtable Forums. <b>Sub-Forums:</b> <a href="#">Yahoo! Web Search</a> , <a href="#">Yahoo! Search Marketing</a> , <a href="#">Yahoo! P</a>
	<b>MSN Roundtable</b> (2 Viewing) The Microsoft <a href="#">MSN</a> Roundtable Forums. <b>Sub-Forums:</b> <a href="#">MSN Web Search</a> , <a href="#">MSN adCenter</a> , <a href="#">MSN Other</a>
	<b>Ask Jeeves Roundtable</b> (1 Viewing)



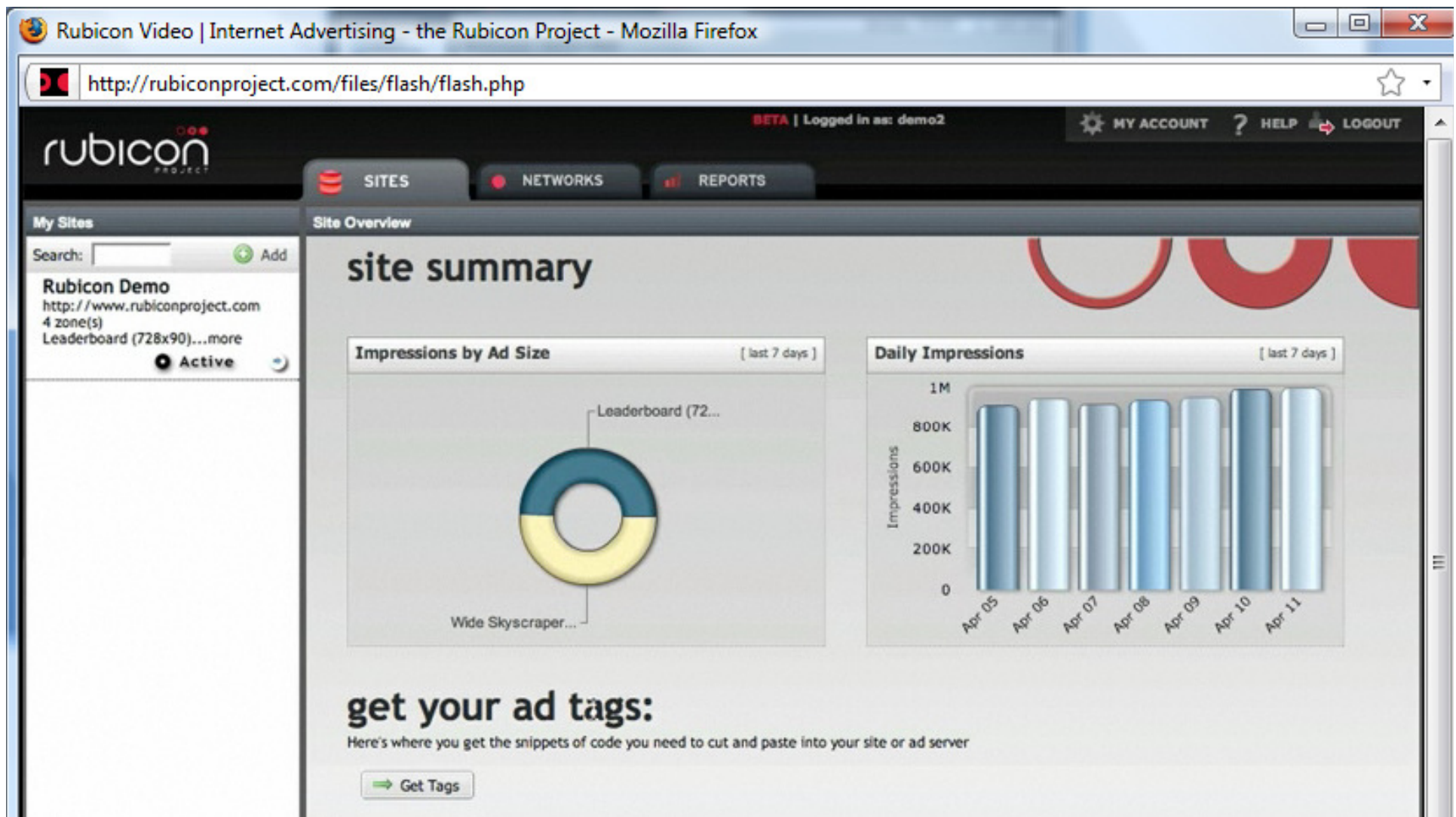












Rubicon Video | Internet Advertising - the Rubicon Project - Mozilla Firefox

http://rubiconproject.com/files/flash/flash.php

BETA | Logged in as: demo2

MY ACCOUNT ? HELP LOGOUT

SITES NETWORKS REPORTS

My Networks

Search:  Add

AdBrite AdBrite

Advertising.com Advertising.com

Google Google

Right Media Right Media

Rubicon Networks

Active Response Group

ad pepper media

Clickbooth

Oridian

Network Management

Allocation by Network

Active Response Group Advertising.com AdBrite Google Right Media Clickbooth Oridian ad p...

80% 90% 100%

Add Network

Search for Network you would like to add:  Search

Add a Network not on the list below

24 7 Real Media 24 7 Real Media Add Network

Active Response Group Active Response Group Add Network

ad pepper media ad pepper media Add Network

AdBrite AdBrite [already added]

Adconion Adconion Add Network

AdDynamix AdDynamix Add Network

Ad Tag Screening

Please choose the Ad Size you would like to screen:

Leaderboard (728x90) Wide Skyscraper (160x600)

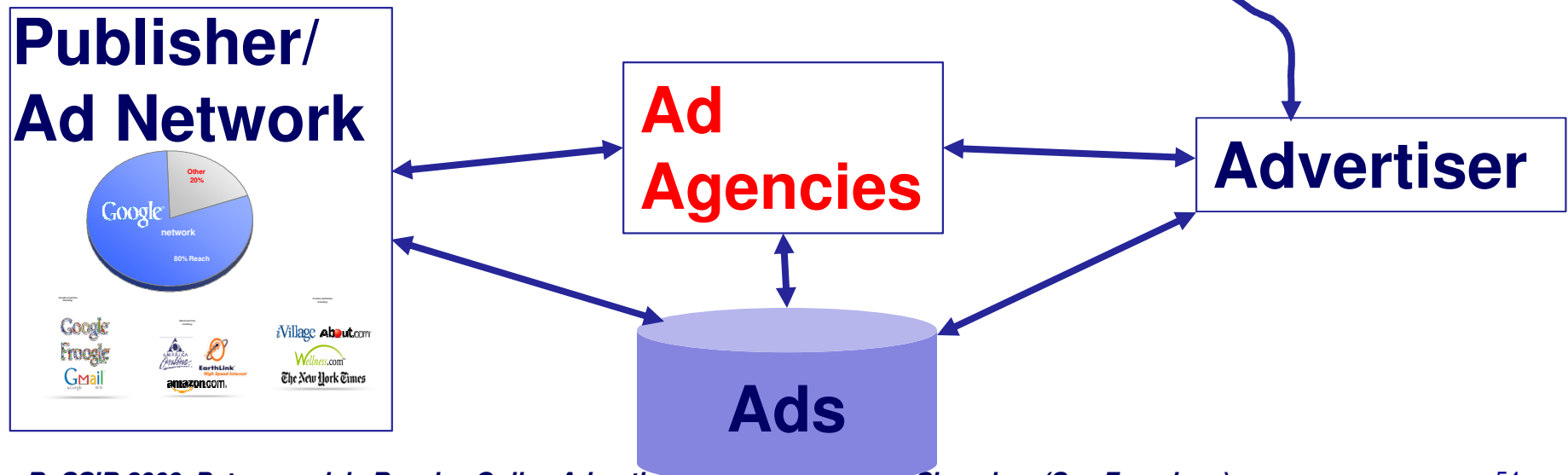
Done



# Advertiser Side: Advertising Agency

An advertising agency or ad agency is a service business dedicated to creating, planning and handling advertising for its clients. E.g., SEMs, Omnicom Group

User



# Ad Agency

---

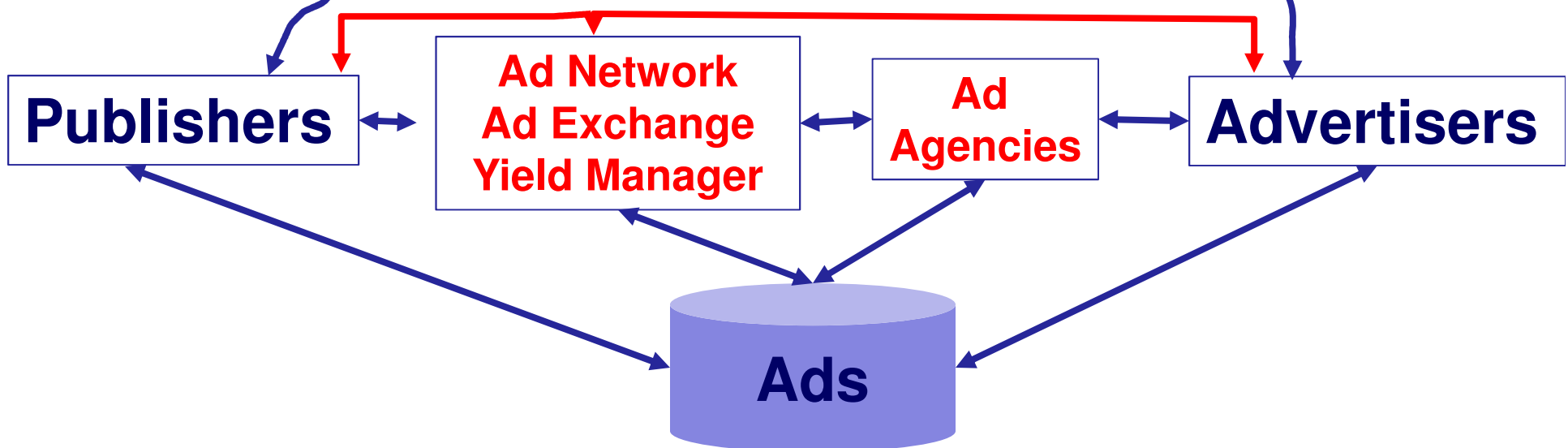
- **An ad agency is a service business dedicated to creating, planning and handling advertising for its clients.**
  - E.g., Search Engine Marketing (SEM), Search Engine Optimization (or SEO), paid placement, and paid inclusion
    - E.g., Efficient Frontier
  - Services include designing and build ad creative, landing page, optimization, media purchase etc.
    - Saatchi & Saatchi

# Online Advertising

**User**



**Plug and play  
Very modular  
(and confusing)**



# Online advertising: who serves who

---

Party	Goal	\$\$\$	Biased towards
Publisher	Generate Revenue	Revenue	User/varies
Advertiser	Communicate a message	ROI	Themselves
Ad Network	Connect advertisers with consumers via publishers	Fees	Advertiser
Yield Mgt	Connect Advertisers with consumers via publishers	Fees	Publishers
User	Being informed (and entertained)		Themselves

- **Advertiser (ROI)**
- **Ad network (revenue, fees)**
- **Publisher (revenue and a happy user)**
  - Yield managers work for publishers
- **Some big players have potential conflict of interests**
  - Provide all services

# Outline

---

- Introduction
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- New Directions
- Challenges in online advertising
- Summary



# Business Models



- **CPM (Cost Per Thousand)**
  - Advertisers pay for exposure of their message to a specific audience. (*M* in the acronym is the Roman numeral for one thousand)
- **CPC (Cost Per Click) aka Pay per click (PPC)**
  - Advertisers pay every time a user clicks on their listing and is redirected to their website.
- **CPA (Cost Per Action) or (Cost Per Acquisition)**
  - The publisher takes all the risk of running the ad, and the advertiser pays only for the amount of users who complete a **transaction, such as a purchase or sign-up.**

# Business Models: Hybrids



- **dCPM Dynamic CPM** a newer hybrid pricing model
- **dCPM pricing** optimizes a campaign towards the sites and site sections that perform best for the advertiser, dynamically paying the most efficient CPM for the value of the inventory to the advertiser.
- **dCPM campaigns** are driven by two parameters, your **Maximum/Average Bidding CPM** and your **CPA target**.
  - As a campaign runs, it “learns” which sites and site sections deliver the CPA targets while staying within your Max CPM requirements.
- **E.g., CPM of \$10; CPA of \$1**

# Some of the Industry Players

---


- **Ad Networks/Exchanges**
  - Google, Yahoo, Microsoft (CPM, CPC, some CPA)
  - Turn.com (CPA, CPC, CPM, dCPM)
  - TribalFusion, 24/7, Kanoodle (CPM, CPC)
  - Advertising.com (CPM, CPC) [platform-A]
  - RightMedia, DoubleClick (CPM)
- **Yield managers (Pubmatic, Rubicon, AddKick)**
- **Affiliate networks**
  - Performics, Hydra Network, Commission Junction/BeFree, LinkShare or Motive Interactive, Amazon (CPA, CPL)
- **Agencies**
  - Omnicom Group, WPP Group, Interpublic Group of Companies and Havas
  - Efficient Frontier, Optimost, Offermatica, TaguchiNow,
- **Ad Platforms (DoubleClick, Atlas, Zedo, OpenX)**

# Online Advertising History


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- CPM**
  - 1994 Banner ads, CPM Banners
  - 1996 Affiliate networks
- CPC**
  - 1997 Goto.com, a 25 employee startup company (later Overture, now part of Yahoo!), created a PPC search engine
  - 1998 Ad Networks (DoubleClick)
  - 2000 Google launches AdWords (ECPM 2002); AdSense (2003)
  - 2001 Behavioural Targeting (Revenue Sciences etc.)
  - 2003 Yahoo acquires Overture
- CPA**
  - 2003 Ad Exchanges, CPA targeted networks
- dCPM**
  - 2005 Publisher-side optimization networks/Yield Management
  - 2007 Yahoo acquires RightMedia and BlueLithium (1\$B)
    - Google acquires DoubleClick (\$3B)
    - Microsoft Acquires Aquantive (\$6B)
    - AOL acquires Quigo (\$340M), Tacoda (~\$300M)
  - 2008 Social Advertising, Data Exchanges

# Ad Placement by .....




salon.com



DREW BARRYMORE JESSICA LANGE  
**GREY GARDENS**  
TONIGHT AT 8PM **HBO**  
CLICK TO VIEW TRAILER IN HD

☒ Salon ☐ The Web
 

powered by **YAHOO!** SEARCH

Site Presented By 

Saturday, Apr 18, 2009

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→ **DAILY**


- 5 Things
- Beyond the Multiplex
- Broadsheet
- The GigaOM Network
- Glenn Greenwald
- How the World Works
- Joan Walsh
- King Kaufman
- Since You Asked
- Video Dog
- War Room

→ **WEEKLY**

- Ask the Pilot
- Comics
- Joe Conason
- Critics' Picks
- I Like to Watch
- Gary Kamiya
- Garrison Keillor

→ **SPECIAL FEATURES**

- 2008 Election
- 2009 Oscar guide
- The Abu Ghraib Files
- Americans Talk About Love
- Atoms and Eden
- The Brand Graveyard




**Don't have a cow!**

Famous animal lover Jeffrey Moussaieff Masson, the author of "The Face on Your Plate," talks about why you should consider giving up the burgers -- and the fromage

By Katharine Mieszkowski


**Politico's twisted take on granting anonymity**

By Glenn Greenwald




**"Crank: High Voltage": Ass-kicking hit man returns**

By Stephanie Zacharek




**Columbine questions we still haven't answered**

By David Sirota




**Torture debate: G. Gordon Liddy and me**


By Joan Walsh



**You say "trans-panic," I say "hate"**

By Tracy Clark-Flory





**Wires 24/7**

Show:

- Car-crazed LA tries to rev up taxi culture
- Remote Mexican town denies being drug lord's home
- Reverse discrimination case could transform hiring
- Grisly slayings brings Mexican drug war to US
- Man accused of triple stabbing deaths denied bail
- NJ scallop boat sinking victim was misidentified
- Public skeptical that woman killed, raped girl
- Shoot first: Columbine transformed police tactics
- New laws treat teen prostitutes as abuse victims
- Italy, Malta argue about stranded migrants



# Why Online Advertising?

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- **Advertiser perspective**

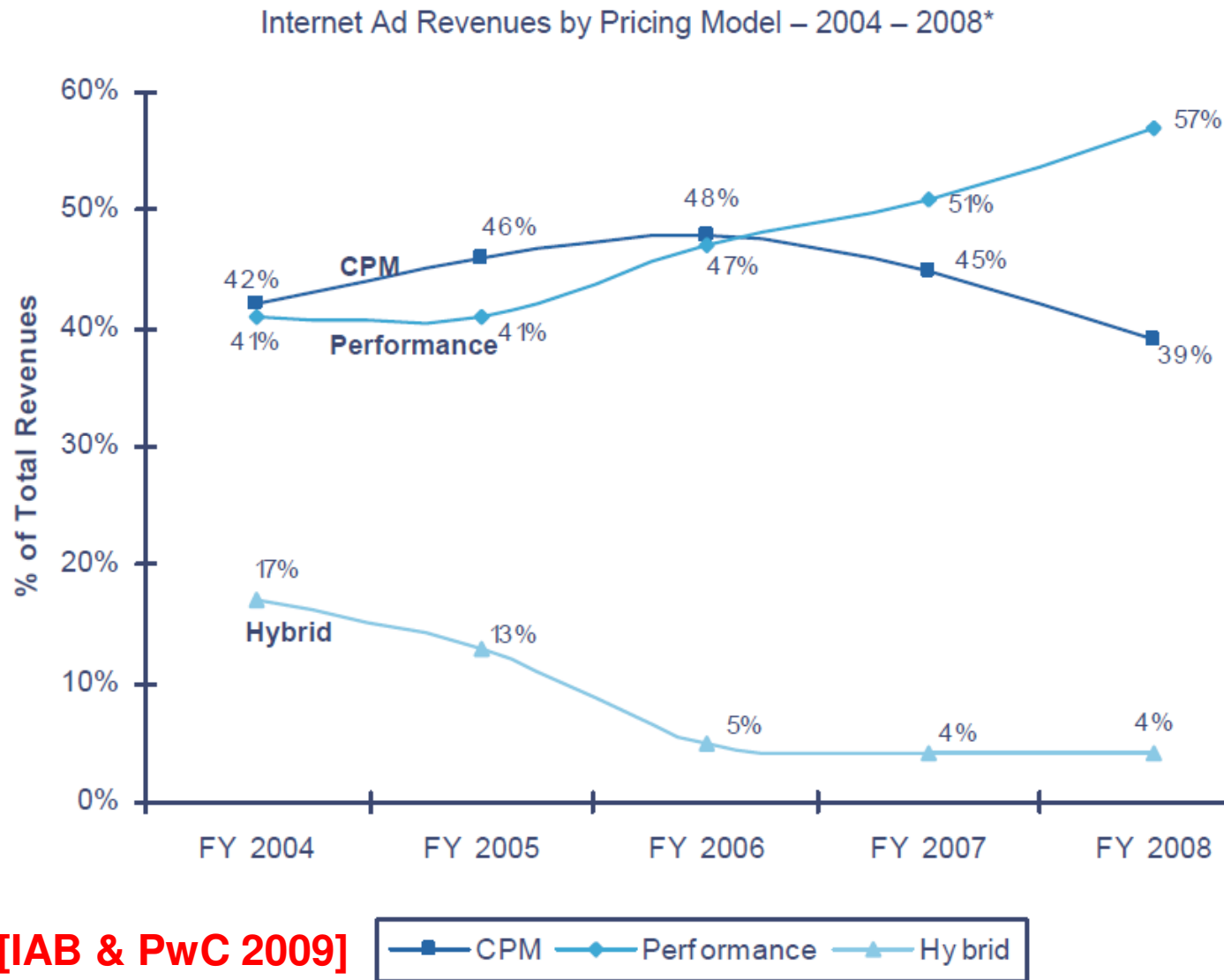
- Fine-grain targeting
- *Deliver an advertiser's message with almost realtime* quantifiable measures of consumer interest (Actions/Clicks/Impressions)
  - ECPM, CTR, ATR, Impressions
- Cheaper
- Reach (volume and time)
- Optimization, dynamic

- **Publisher perspective**

- Offline revenue is on the decline
  - E.g., media giants such as newspapers, TV (20-40% decline)
- Efficient market places
- Optimization
- Fine-grain targeting => utility to consumer

- **User (free/reduced price goods/services), less annoying?**

# Performance based pricing dominates



**Performance basis**  
(e.g., cost-per-click,  
sale, lead or  
straight revenue  
share);

**CPM or impression  
basis** (includes  
sponsorships)

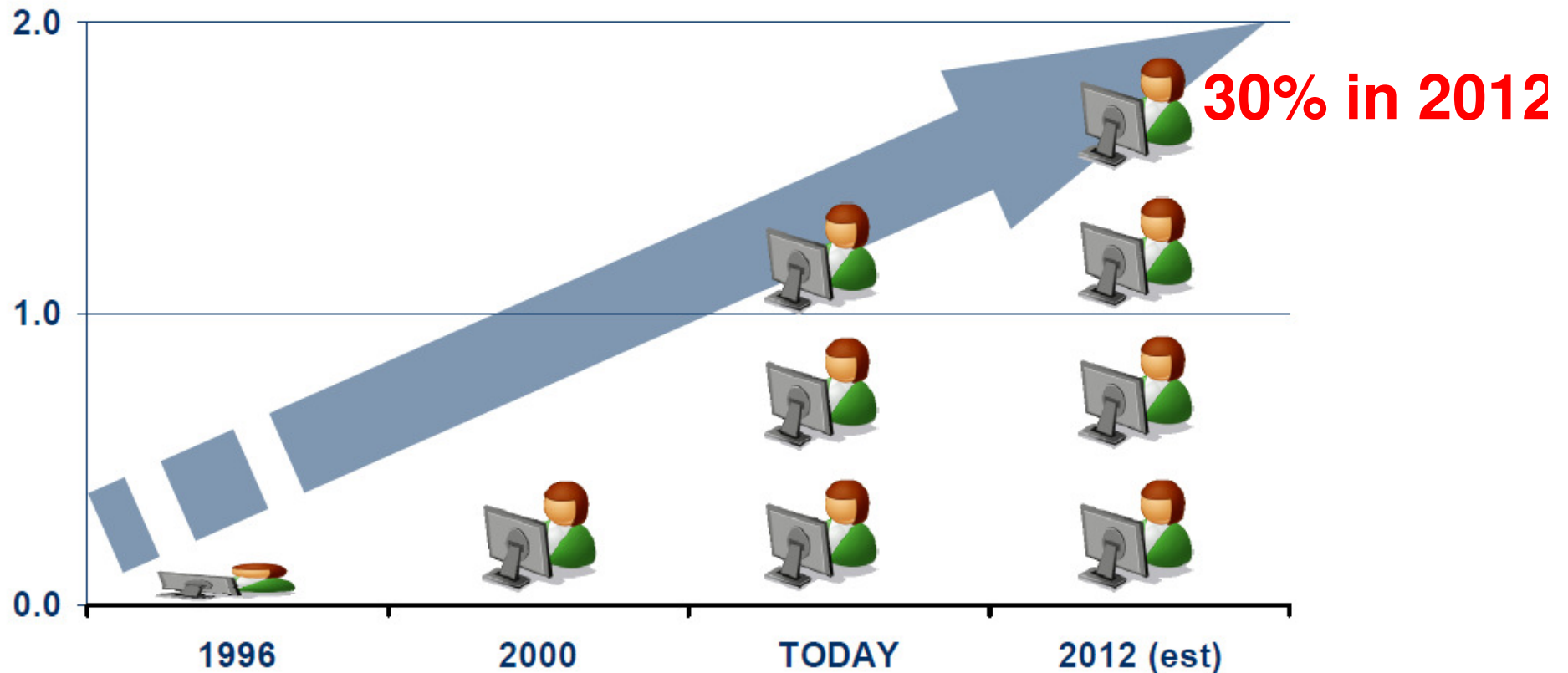
**Hybrid basis** (e.g.,  
mix of impression-  
based pricing plus  
performance-based  
compensation)

# Online Reach: 25% of the world today

## Measuring the Online World



### Billions Online



[John Gantz, IDC's Digital Marketplace Model and Forecast, IDC 2008]

Source: IDC, 2008

# 2/3 of Americans are online.....

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## US Internet Users, 2007-2012 (millions and % change)

---

2007	188.1 (3.4%)
2008	193.9 (3.1%)
2009	200.1 (3.2%)
2010	206.2 (3.1%)
2011	211.9 (2.8%)
2012	216.9 (2.4%)

*Note: eMarketer defines an Internet user as any person who uses the Internet from any location at least once per month*

*Source: eMarketer, January 2008*

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091593

[www.eMarketer.com](http://www.eMarketer.com)

- **US Internet users spent 15.3 hours a week online last year [eMarketer.com, 2008]**

# Mobile Access will be big!

---

- Users accessed the Internet through more than 1.5 billion devices worldwide in 2008, including PCs, mobile phones, and online video game consoles.
- By 2012, the number of devices accessing the Internet will double to more than three billion, half of which will be mobile devices.
- China passed the US in 2007 to become the country with the largest number of Internet users. China's online population is forecast to grow from 275 million users in 2008 to 375 million users in 2012.

**[John Gantz, IDC 2008]**





Today



**By 2012, emerging markets will have majority of the world's online users and devices while their share of ecommerce will grow from approximately 20% to 30%**

Tomorrow



**[John Gantz, IDC 2008]**

Source: IDC, 2008

# 61 Billion Worldwide Searches/Month

## Worldwide Search by Region, August 2007

Region	Unique Searchers (000)	Searches (M)	Searches Per Searcher
Worldwide	754,459	61,036	80.9
Asia-Pacific	257,952	20,295	78.7
Europe	209,678	17,846	85.1
North America	206,278	15,976	77.4
Latin America	49,995	4,784	95.7
Middle East-Africa	30,556	2,134	69.8

### Notes:

1. Searchers were aged 15 and older, using home and work locations.
2. Results exclude traffic from public computers, such as Internet cafes, and access from mobile phones and PDAs.

Source: comScore, 2007

# Top 10 Search Properties - Worldwide

## Top 10 Worldwide Search Properties, August 2007

Search Property	Searches (M)	% Searches
Worldwide	61,036	100
Google	37,091 ~1B per Day (WW)	60.8
Yahoo	8,540 0.13B per Day (US)	14.0
Baidu.com Inc.	3,253	5.3
Microsoft	2,166	3.5
NHN Corp.	2,044	3.3
eBay	1,319	2.2
Time Warner Network	1,212	2.0
Ask Network	743	1.2
Fox Interactive Media	683	1.1
Lycos Inc.	441	0.7

### Notes:

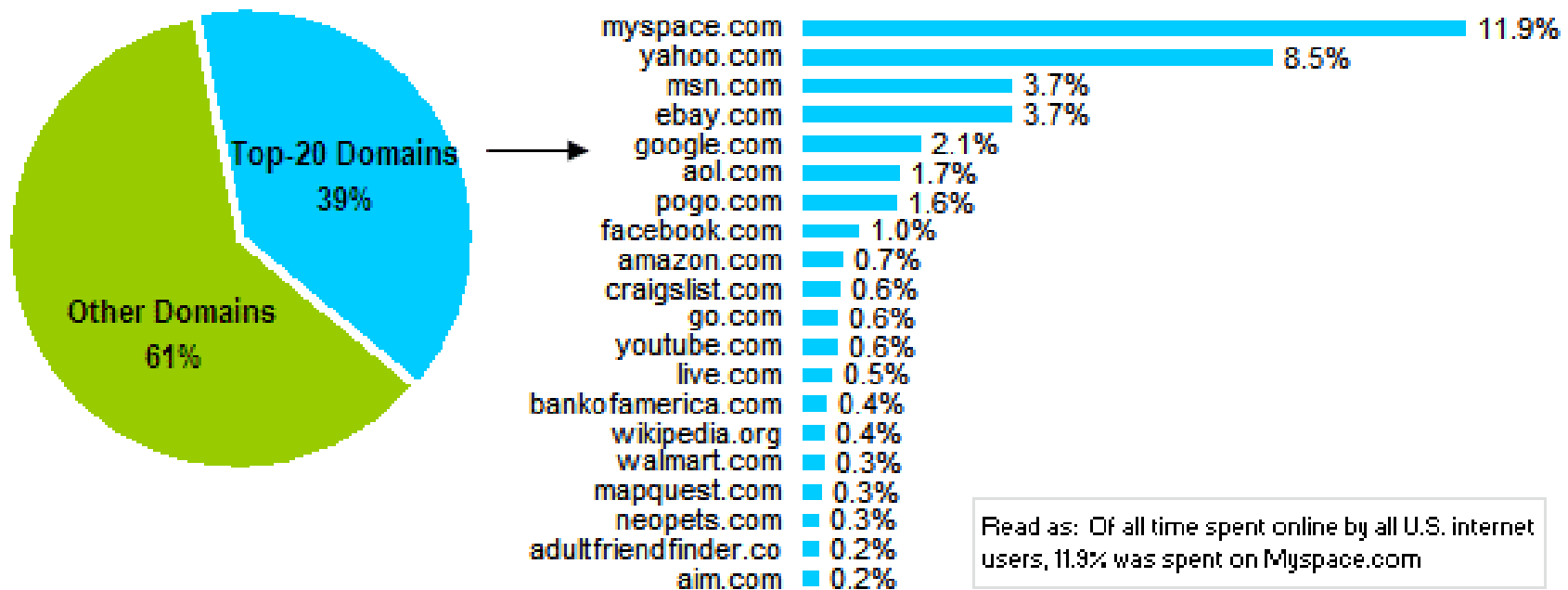
1. Searchers were aged 15 and older, using home and work locations.
2. Search properties were based on top the 50 properties worldwide where search activity is observed.
3. Results exclude traffic from public computers, such as Internet cafes, and access from mobile phones and PDAs.

Source: comScore, 2007

# Where people spend time?

## Where are People Spending their Time?

(% of total time spent online in the United States - December 2006)



- Only 20 domains capture a whopping 39% of all our time spent online.
- *Only 2.1% of our time is spent on Google.com (includes all subDoms)*
- Revenue from search accounts for 41% (in US)
  - [[http://www.iab.net/media/file/IAB\\_PwC\\_2007\\_full\\_year.pdf](http://www.iab.net/media/file/IAB_PwC_2007_full_year.pdf)]

# What are people doing online?

---

- **Online Publisher Organization's (OPA) Internet Activity Index [Nielsen/NetRatings].**
  - 47 % of consumers time is spent viewing online content
    - including video-sharing sites, news sites, video, social nets, weather and blogs (Up from 34% in 2003)
  - 33 % is spent on communications, (46% in 2003).
  - 15 % Commerce
  - 5% search (Search-based OA revenue > 50%)
- **14 hours per week online (versus 14 hours watching TV) [JupiterResearch.com, 2007]**
- **Online advertising is ROI-centric; Brand advertising has still to catch on**



# Why Online Advertising?

---

- **Advertiser perspective**

- Fine-grain targeting
- *Deliver an advertiser's message with almost realtime quantifiable measures of consumer interest (Actions/Clicks/Impressions)*
  - ECPM, CTR, ATR, Impressions
- Cheaper
- Reach (volume and time)
- Optimization

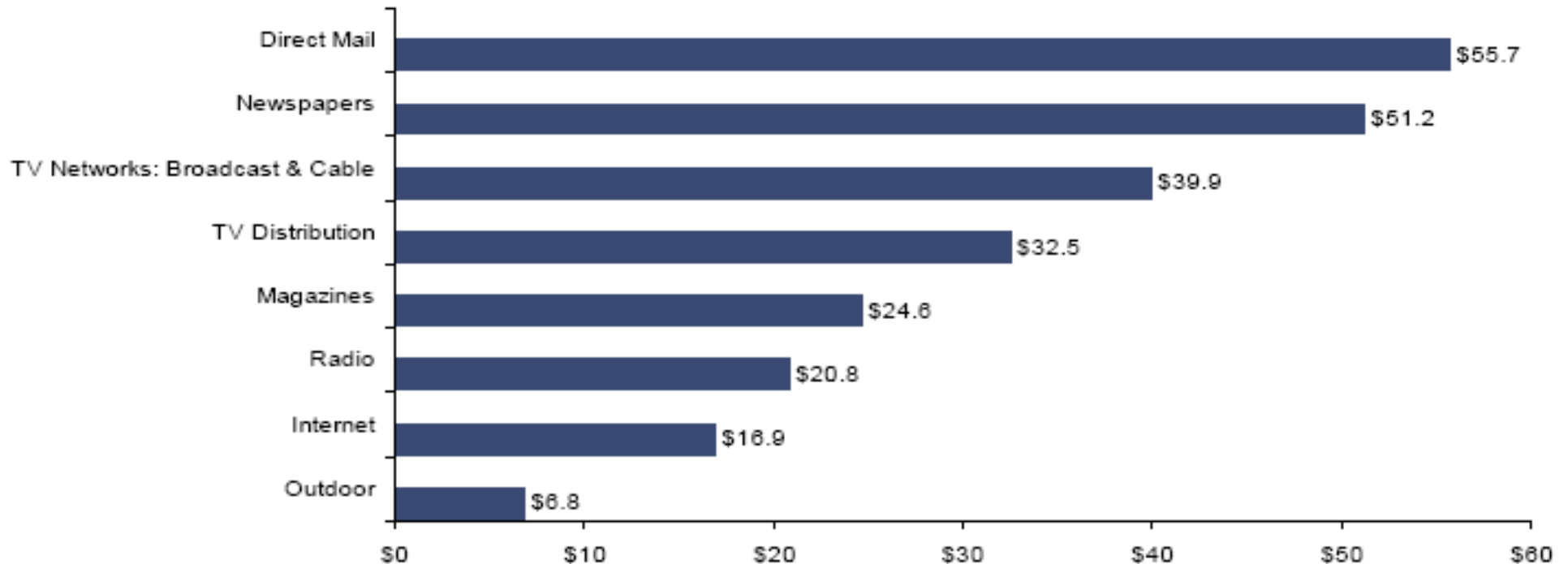
- **Publisher perspective**

- Offline revenue is on the decline
  - E.g., media giants such as newspapers, TV (20-40% decline)
- Efficient market places
- Optimization
- Fine-grain targeting => utility to consumer

- **User (free/reduced price goods/services), less annoying?**

# Internet Adv = 5.9% of Total Adv Spend

U.S. Advertising Market-Media Comparisons—2006 (\$ Billions)

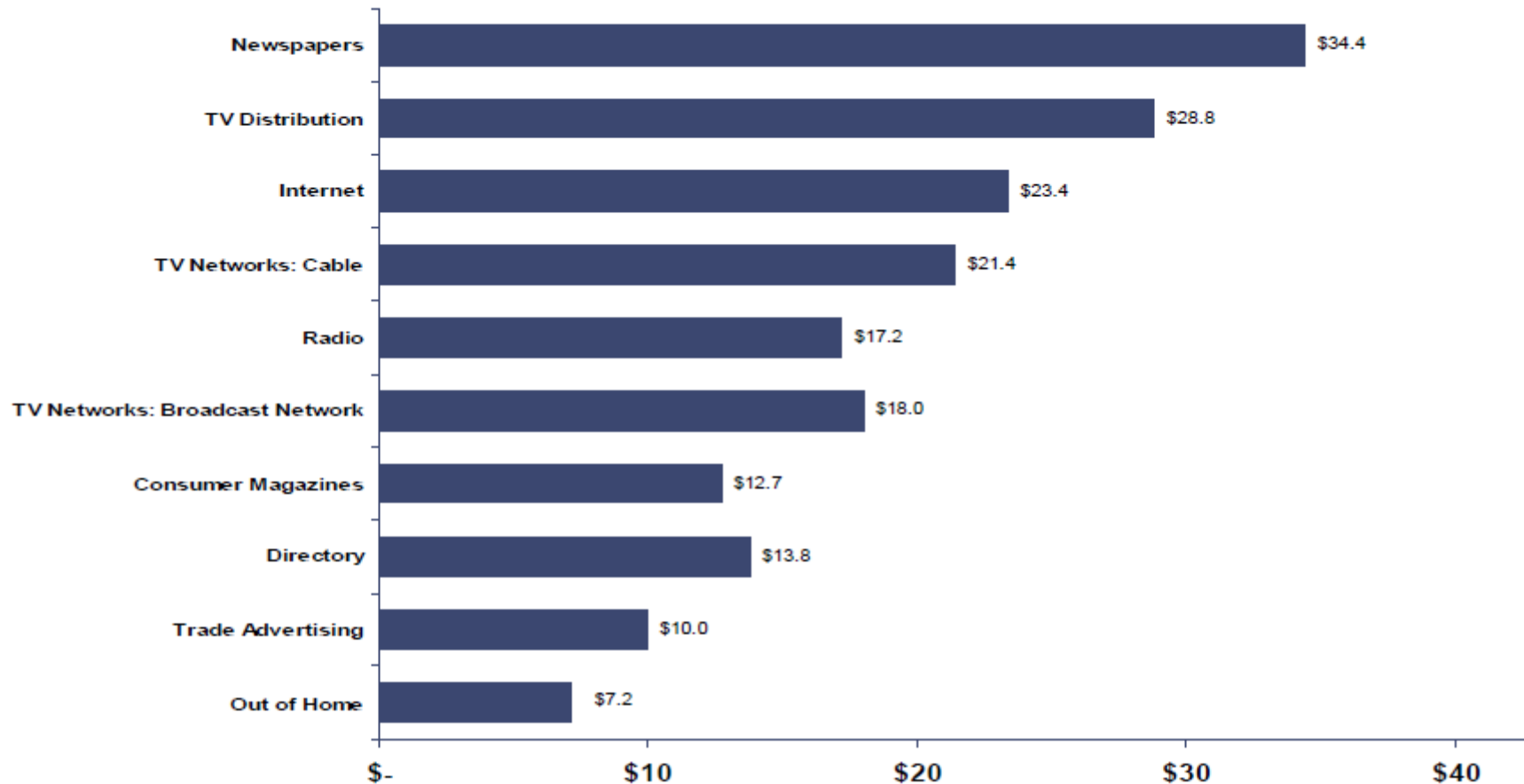


\*The total U.S. advertising market is estimated at approximately \$285 billion, and includes other segments not charted here.

**Internet advertising revenues accounted for approximately 5.9% of total U.S. ad spending in 2006 (285B), up from approximately 4.7% in 2005; An annual growth of 25% versus of an overall growth of 7%**

# Online Advertising is about 10% [2008]

U.S. Advertising Market – Media Comparison – 2008 (\$ Billions)



\*The total U.S. advertising market includes other segments not charted here.

\*\*TV Distribution\* includes national and local TV station ads as well as multichannel system ads.

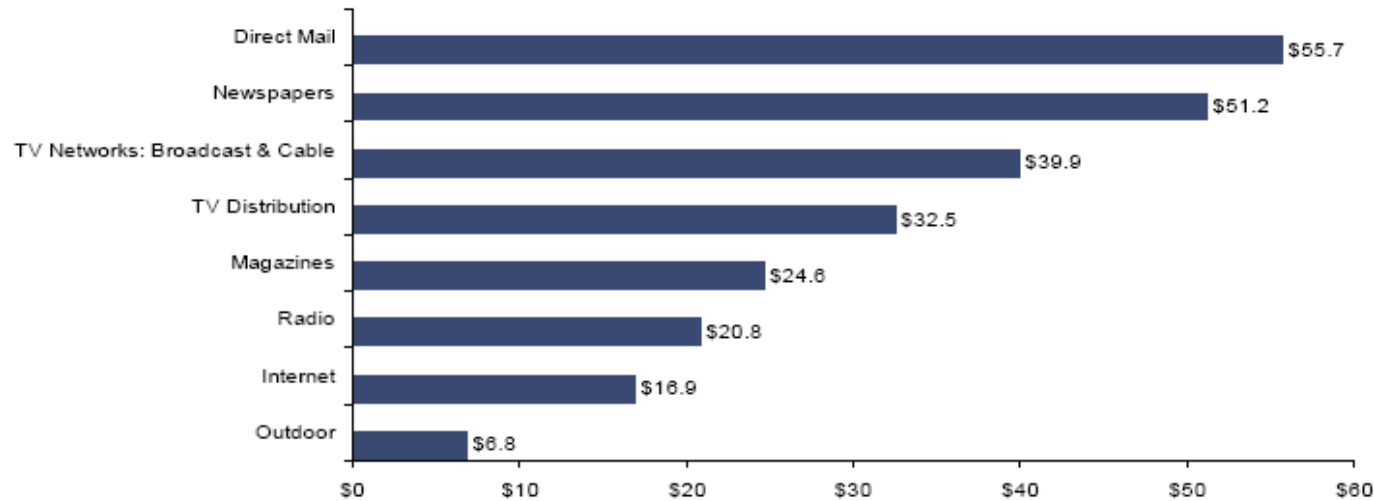
Sources: IAB Internet Ad Revenue Report; PricewaterhouseCoopers Global Entertainment and Media Outlook

**Overall Advertising spend across all media (direct marketing not included here runs at \$50B**

RuSSIR 2009, Petrozavodsk, Russia. Online Advertising © 2009 James G. Shanahan (San Francisco)

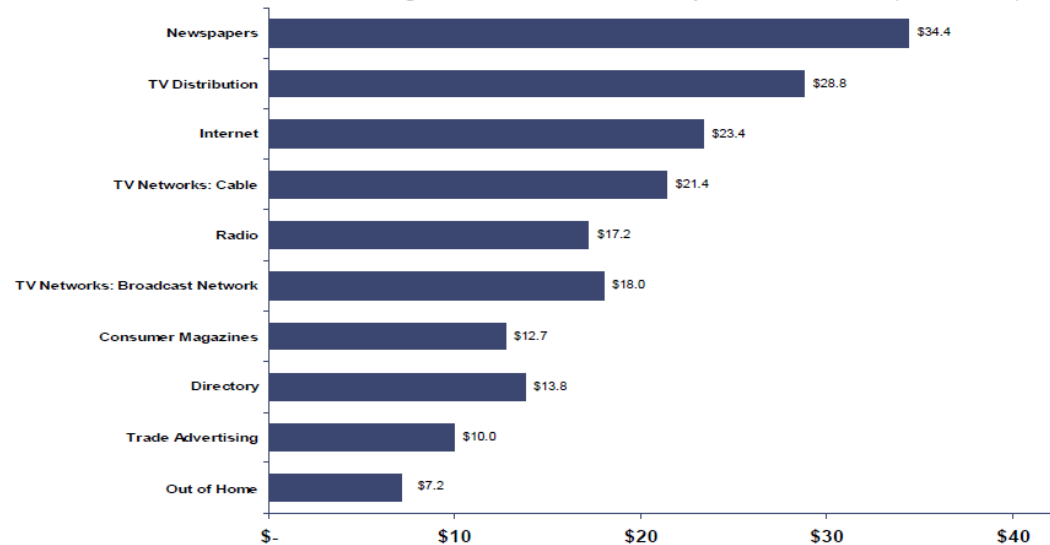
James.Shanahan\_AT\_gmail\_DOT\_com

## U.S. Advertising Market-Media Comparisons—2006 (\$ Billions)



\*The total U.S. advertising market is estimated at approximately \$285 billion, and includes other segments not charted here.

## U.S. Advertising Market – Media Comparison – 2008 (\$ Billions)



\*The total U.S. advertising market includes other segments not charted here.

\*\*TV Distribution\* includes national and local TV station ads as well as multichannel system ads.

Sources: IAB Internet Ad Revenue Report; PricewaterhouseCoopers Global Entertainment and Media Outlook

i. Shanahan (San Francisco)  
James.Shanahan\_AT\_gmail\_DOT\_com

# US Online Advertising relative spend ↑

## US Online and Total Media Advertising Spending, 2006-2011 (billions and % of total media spending)

	Internet	Total media	Internet % of total media
2006	\$16.9	\$281.6	6.0%
2007	\$21.4	\$287.5	7.4%
2008	\$27.5	\$295.5	9.3%
2009	\$32.5	\$301.5	10.8%
2010	\$37.5	\$309.0	12.1%
2011	\$42.0	\$316.0	13.3%

*Note: eMarketer benchmarks its US online advertising spending projections against the Interactive Advertising Bureau (IAB)/PricewaterhouseCoopers (PwC) data, for which the last full year measured was 2006; online ad data includes categories as defined by IAB/PwC benchmark—display ads (such as banners), paid search ads (including contextual text links), rich media (including video), classified ads, sponsorships, referrals (lead generation) and e-mail (embedded ads only); excludes mobile ad spending; eMarketer benchmarks its US total media advertising spending projections against the Universal McCann data, for which the last full year measured was 2006; includes television (broadcast and cable), radio, newspapers, magazines, Internet (excludes mobile), outdoor, direct mail, yellow pages and other*

*Source: eMarketer, October 2007*

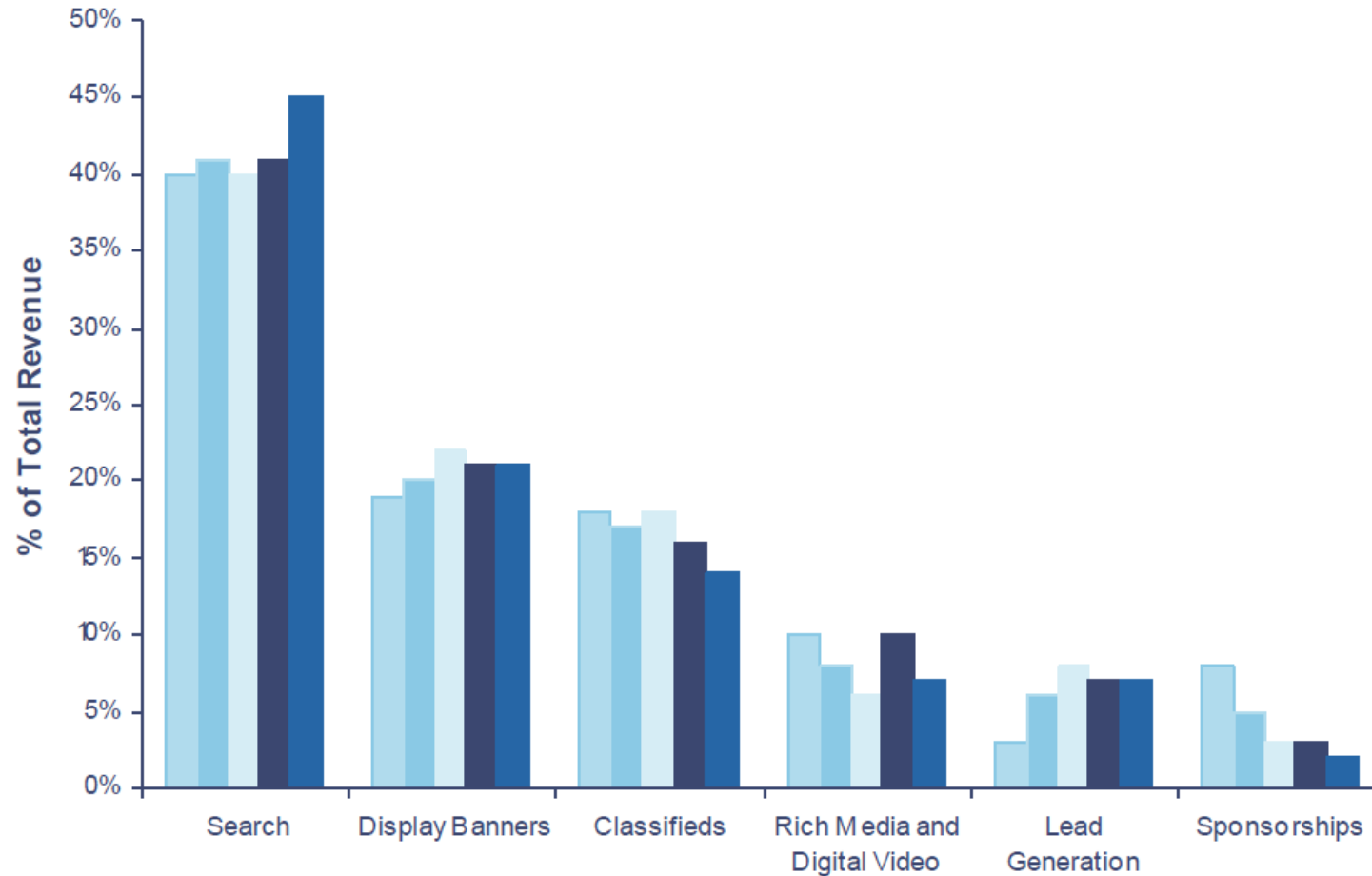
088473

www.eMarketer.com



# Ad Revenue by Ad Format

Internet Ad Revenue Share by Advertising Format – 2004 – 2008\*



[IAB PwC]

FY 2004 FY 2005 FY 2006 FY 2007 FY 2008

# Sponsored Search vs. Contextual

---

**E.g., Google**

- **Google-owned sites generated revenues of \$3.70 billion, or 67% of total revenues [q1, 2009]**
- **Google Network Revenues - Google's partner sites generated revenues, through AdSense programs, of \$1.64 billion, or 30% of total revenues, in the first quarter of 2009.**

<http://finance.yahoo.com/news/Google-Announces-First-bw-14949372.html>

# Online Advertising – Recap so far

---

- **Goals of Online advertising**
  - *Deliver an advertiser's message with quantifiable measures of consumer interest*
  - Enable ads as a medium of information!
- **Online advertising is a relatively new field**
  - CPM (1995), CPC (1998), CPA (2004), dCPM
  - \$23.4 billion in USA (2008), \$65B worldwide (10% of overall ad spend); 57% Performance-based
  - Contextual Advertising is growing (30% for in Q1/2009 for Google)
- **Strengths**
  - Reach, targeted, cheap, quantifiable measures of consumer interest
- **Issues**
  - Privacy, ad placement, deception (e.g., phishing), fraud (e.g., click fraud), moral conscience, bandwidth issues

# Outline

---

- Introduction
- Online advertising background
- Business models
- Creating an online ad campaign
- Technology and Economics
- New Directions
- Challenges in online advertising
- Summary

# Creating an online ad campaign

---

- **Typical workflow**

- Create advertiser account (name/address/Credit card details/etc.)
- Create ad creative
- Create an ad campaign
- Upload creative's
- Specify targeting constraints (e.g., keywords, categories, geo, dates)
- Specify bid price and budget
  - At Turn Inc. (CPA network), just specify the bid price for an action; no need for keyword portfolio management
  - Deploy action beacon on landing page
- Optimize ad creative/user-landing-experience, bid price: AB Test, DOE

- **Ad network/exchange**

- Turn.com (CPA, CPC, CPM), Google (CPC, CPM), Yahoo (CPC, CPM), Right Media (CPM), Etc.

- **SEM: e.g., Efficient Frontier**



# A Typical Text-based CPC Ad

---



1. Specify Start/End Dates of Campaign
2. Specify keywords+bids
3. Specify Budget
4. Specify other constraints (locality/publisher/etc)

# E.g., Google AdWords

---

[Video](#) [News](#) [Maps](#) [Gmail](#) [more ▼](#)

james.shanahan@gmail.com | [iGoogle](#) | [My Account](#) | [Sign Out](#)

[Advanced Search](#)  
[Preferences](#)  
[Language Tools](#)

[Advertising Programs](#) - [Business Solutions](#) - [About Google](#) - [Go to Google Italia](#)

[Make Google Your Homepage!](#)

©2007 Google

# Advertise your business on Google

No matter what your budget, you can display your ads on Google and our advertising network. Pay only if people click your ads.

[Sign up now »](#)

Your ads appear beside related search results...

People click your ads...

...And connect to your business



Sign in to Google AdWords with your

**Google Account**

Email:

Password:

[Sign in](#)

[Forgot your password?](#)

## Learn about AdWords

How it works

[Why it works](#)

[Costs and payment](#)

[For local businesses](#)

[Assisted signup options](#)

[Success stories](#)

### You create your ads

You create ads and choose keywords, which are words or phrases related to your business.

[Get keyword ideas](#)

### Your ads appear on Google

When people search on Google using one of your keywords, your ad may appear next to the search results. Now you're advertising to an audience that's already interested in you.

### You attract customers

People can simply click your ad to make a purchase or learn more about you. It's that easy!

[Sign up now](#) | [Next topic »](#)



**Keywords** are what people search for on Google.



Ru.

T\_com

# Advertiser Workflow

Account Summary
Campaigns
Reports
Account Administration

Geography
Distribution
Keywords
Pricing
Create Ad
Review
Budget & Schedule
Activate

## Set Pricing

Enter a **maximum cost per click (CPC)** <sup>?</sup>. Experiment with different amounts until you are satisfied with your estimated results.

**Tips:**  
[Pricing Strategies](#)

**Sponsored Search**  
To get the most available traffic we estimate a PPC of **\$0.80** <sup>?</sup>  
\$

	Estimated Monthly Clicks	Estimated Average Position	Share of Potential
Default Bidded Keywords (5)	443	3.0	96%
Ad Group Total (6)	493	2.1	77%

16.6% of your traffic is from overridden bids on Sponsored Search keywords.

Graph Display: ☐ Clicks to Bid ☒ Share of Potential

**Default Bid Traffic Avg. PPC - \$1.84**

- Estimated Clicks 50
- Missed Clicks 1,254

**Custom Bid Traffic Avg. PPC - \$0.78**

- Estimated Clicks 250
- Missed Clicks 250

**Content Match**

To get the most available traffic we estimate a PPC of **\$0.80** <sup>?</sup>

\$

Estimated Monthly Clicks	Share of Potential
263	90%

YOUR BID

MAX. CPC 0.50 0.60 0.70 0.80

Your Estimated Average CPC: **\$0.72**

**Advertising campaign: a series of advertisement messages that share a single idea**

# Select Portfolio of Keywords

[<https://adwords.google.com/select/KeywordToolExternal?defaultView=2>]

► [Filter my results](#)

Choose columns to display:  ?

Calculate Estimates using Max CPC:

Keywords related to term(s) entered - sorted by relevance ?

<a href="#">Keywords</a>	<a href="#">Estimated Ad Position</a> ?	<a href="#">Estimated Avg. CPC</a> ?	<a href="#">Advertiser Competition</a> ?	<a href="#">Search Volume: March</a> ?	<a href="#">Avg Search Volume</a> ?	<a href="#">Search Volume Trends (Dec 2006 - Nov 2007)</a> ?	<a href="#">Highest Volume Occurred In</a>	Match Type: <input type="text" value="Broad"/> ?
data mining	1 - 3	\$0.20	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	Oct	<a href="#">Add</a> ▾
data mining software	4 - 6	\$0.25	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	Oct	<a href="#">Add</a> ▾
data mining tools	1 - 3	\$0.24	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	Apr	<a href="#">Add</a> ▾
web data mining	4 - 6	\$0.21	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	Nov	<a href="#">Add</a> ▾
data mining techniques	1 - 3	\$0.23	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	Oct	<a href="#">Add</a> ▾
data mining	4 - 6	\$0.24	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	Nov	<a href="#">Add</a> ▾



# Regional Targeting

Google AdWords: Regional and Local Targeting - Windows Internet Explorer

https://adwords.google.com/select/targeting.html

Search Web | Mail | My Yahoo! | Autos | Games | Music | Answers | Personals | Sign In

Gmail - Inbo... | Forrester Res... | LinkedIn: Ja... | Stationary pr... | ECML/PKDD... | Google AdW... | iptv - Yahoo!... | Google A...

Google AdWords

[AdWords Home](#)

[AdWords Support](#)

Overview

[AdWords Advantages](#)

[Program Comparison](#)

[Success Stories](#)

[News and Updates](#)

[Demos and Guides](#)

[Industry Research](#)

[Inside AdWords Blog](#)

Getting Started

[Editorial Guidelines](#)

[Step-by-Step](#)

[Tips for Success](#)

[Account Navigation](#)


[Keyword Tools](#)

[Contact Us](#) - [Help](#)

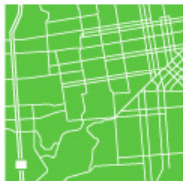
## Regional and Local Targeting: Sharpen Your Advertising Focus

With AdWords, you can target your ads to appear only in specific geographic locations. You can choose country-level targeting or narrow your focus to:

**Region and city-level targeting:** Show your ads to people searching for results in regional areas you choose. (Available in select countries.)




Region




City

**Customized targeting:** Show your ads to people searching for results in an area you define. (Available worldwide.)



Within your defined radius



Within your defined borders

- **How does this benefit me?**  
When you target regional and local areas, you can reach the prospects who are most appropriate for your business and you can write ads that highlight special promotions or pricing based on geography.
- **Which ad targeting option is right for me?**  
Use regional and city-level targeting if you know which specific cities and regional areas are appropriate for your market. Choose customized targeting if you want to define your own target area. Indicate your area by choosing a point and a surrounding radius or by picking points to define a border.
- **How does this work?**  
The AdWords system may analyze a searcher's query (for example "London florist") to establish what location that person is searching for. The system may also take note of the person's Internet Protocol (IP) address to see where he or she is searching from.
- **I'm ready to reach new customers now. How do I get started?**  
All you need to do is [create and activate an AdWords account](#).

**See Local Targeting in Action**

View our interactive demo to explore this targeting option and learn how to set up a local or regional AdWords campaign of your own. [Start Demo](#)

Done

Internet | Protected Mode: On

100%

# Upload Ad Creatives 1-by-1 or in Bulk

## Lat / Long ZIP Code Data

Commercial grade  
database \$29 Used by  
fortune 500 companies  
[www.zip-code-latitude.com](http://www.zip-code-latitude.com)

## Latitude Longitude Data

U.S., Canada, Mexico  
Zip Codes Used by  
most of Fortune 100-  
precise!  
[GreatData.com](http://GreatData.com)

## STATISTICA - Data Mining


Winner of all comparative reviews  
since 1993 - Free Evaluation CD  
[www.StatSoft.com](http://www.StatSoft.com)



1. Bulk Upload
2. Or upload raw ingredients and generate ad (list of products)

# Analytics : Managing Ad Campaigns

- You choose your own maximum daily spending limit (daily budget)
- Choose how much you want to spend per click for every keyword
- Pay Google for users who click on your ad
- More cost-effective than Yellow Pages, Banner Ads & Direct Mail (CPM)\*
- Conversion tracking = real-time return-on-investment data



[Log Out](#) - [Contact Us](#) - [Help](#)

Campaign Management
Reports
My Account

Campaign Summary
 

Search my campaigns:  Go  
keywords, ad text, etc.

### All Campaigns

Show all campaigns ▼

**Sep 25, 2003**

+ Create New Campaign

Pause
Resume
Delete
Edit Settings

Show statistics for:  

○
yesterday
▼

○

Sep
▼
25
▼
2003
-
Sep
▼
25
▼
2003
Go

<input type="checkbox"/>	Campaign Name	Current Status	Current Budget	Clicks	Impr.	CTR	Avg. CPC	Cost	Avg. Pos	Conv. Rate	Value/ Cost
<input type="checkbox"/>	Campaign #1	Active	\$3000.00 / day	3244	101,386	3.2%	\$0.74	\$2400.56	1.9	8.4%	4.55
<input type="checkbox"/>	Campaign #2	Active	\$1500.00 / day	6122	244,895	2.5%	\$0.21	\$1285.62	2.2	6.5%	3.94
<input type="checkbox"/>	Campaign #3	Active	\$500.00 / day	2226	54,301	4.1%	\$0.18	\$400.68	1.6	2.1%	5.34
<input type="checkbox"/>	Campaign #4	Active	\$500.00 / day	2078	98,971	2.1%	\$0.16	\$332.48	3.5	2.5%	3.72
<b>Total - all 4 campaigns</b>		-	<b>\$5500.00 / day</b> <small>active campaigns</small>	<b>13,671</b>	<b>499,553</b>	<b>3.0%</b>	<b>\$0.32</b>	<b>\$4419.34</b>	<b>2.30</b>	<b>4.9%</b>	<b>4.39</b>

\*Reporting is not real-time. Clicks and impressions received in the last 3 hours may not be included here.

\*\* U.S. Bancorp Piper Jaffray, New Methods in Search Marketing: Contextual Advertising and Other Evolutions (Safa Rashtchy), June 2004  
 RuSSIR 2009, Petrozavodsk, Russia. Online Advertising © 2009 James G. Shanahan (San Francisco)

James.Shanahan\_AT\_gmail\_DOT\_com

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# Expensive Keywords

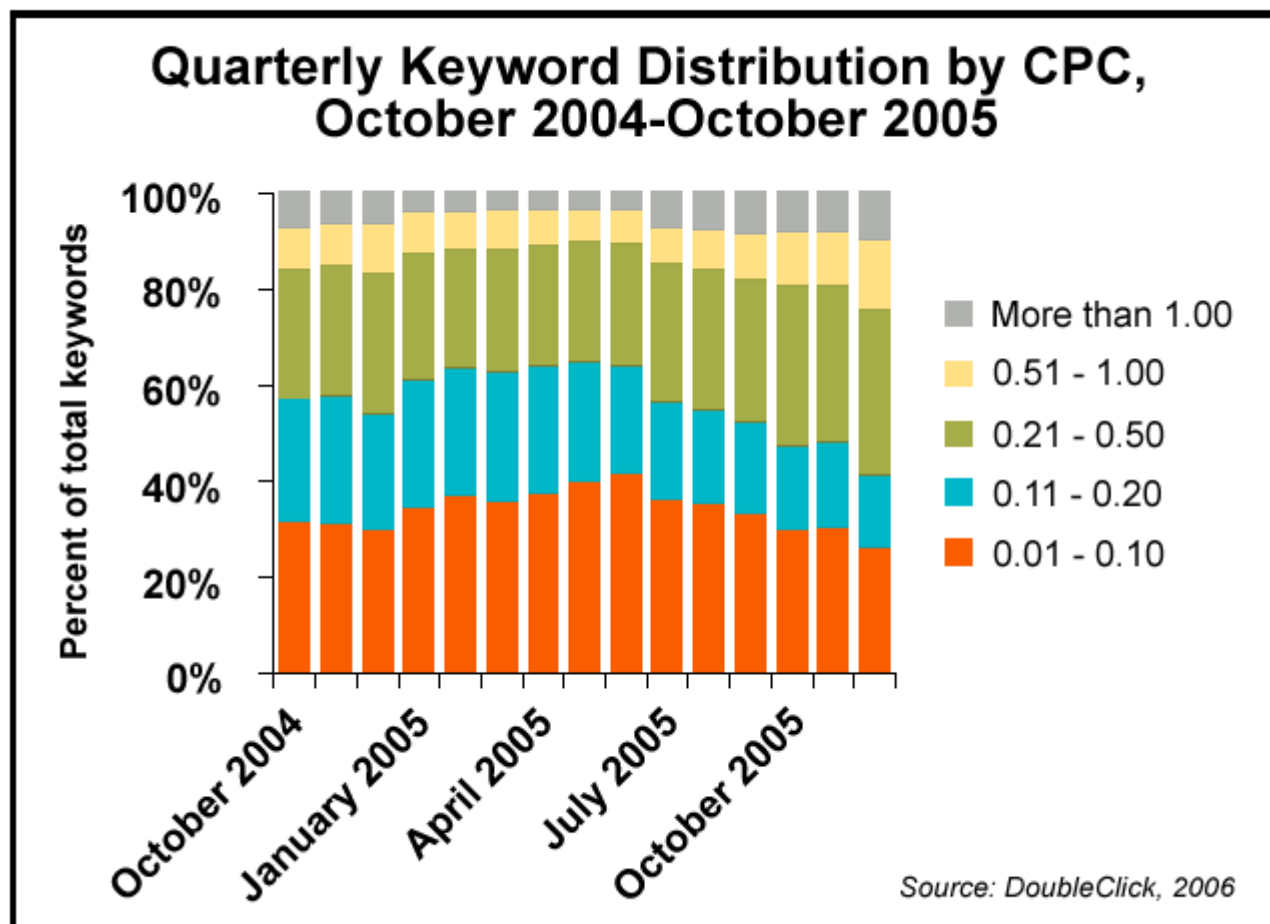
- Most of the keywords hovering around \$100 are for personal injury lawyers or lawsuits.
- For example [webmasterworld.com, 10/2006]
  - mesothelioma - a type of cancer caused by exposure to asbestos is fetching \$100/CPC
  - loan consolidation, \$65/CPC; insurance quotes \$60/CPC
- According to Wall Street Journal, 4/2004
  - \$70.24 Mesothelioma Attorney

**Revenue=  $1.60 * 0.026 * 10^9 = \$40\text{M/day} = \$14\text{B/Year}$**

\$50.00 Investment Fraud

\$19.00 Wisconsin Mortgage; \$18.22 Conference Calling; \$14.97 Casino

- **Average CPC=\$1.60 (on Google); Avg CTR=2.6%#**
    - Google ECPM = ~\$40; Social Networks ECPM of about \$0.20; Premier publishers ECPM of \$40-\$50 (more targeted)
- #[MarketingSherpa, 9/2005]  $ECPM \$41 = 1.60 * 0.026 * 1000$



# Publisher Workflow

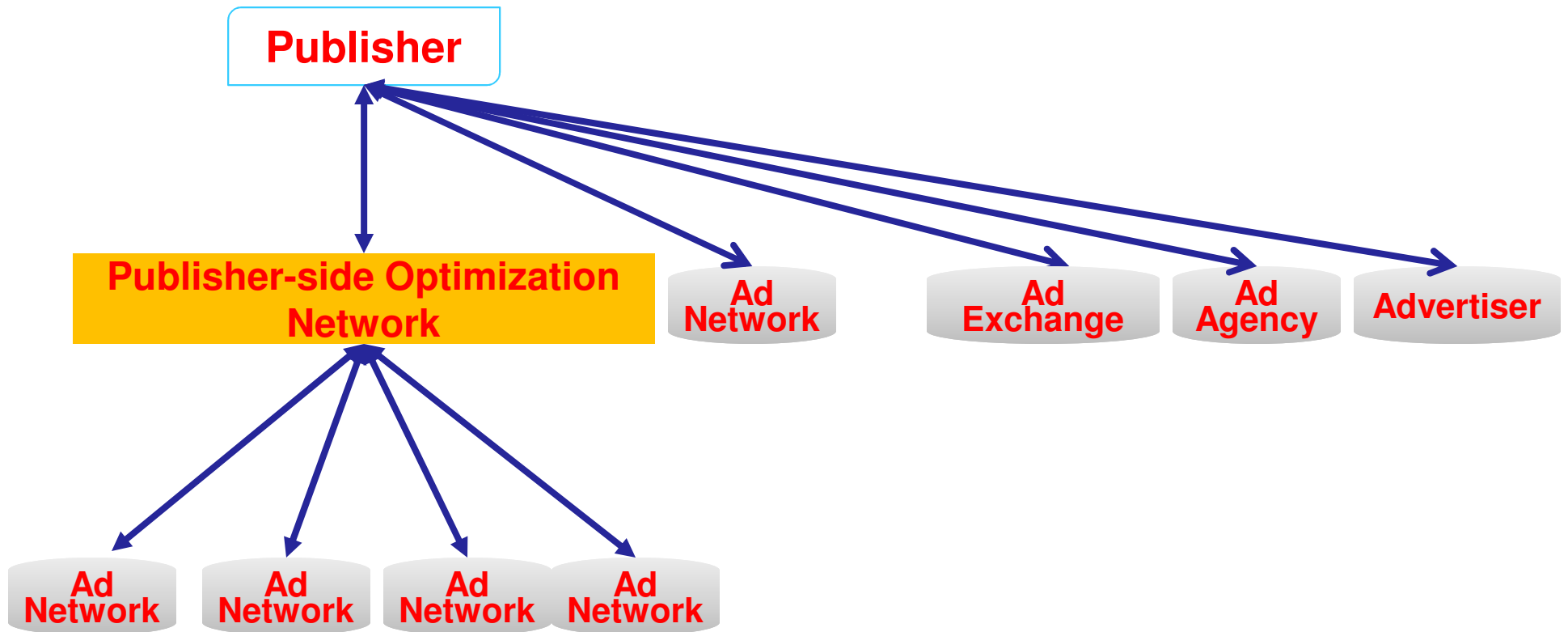
---

- **Similar steps to Advertiser workflow**
- **Sign up with an ad network (e.g., Google) or with an exchange, or with an advertiser etc.**
- **May be able to impose constraints on ads shown (e.g., size, border, adtype, category of ad)**
- **Decide ad types**
  - Contextual ads
    - AdSense puts relevant text ads next to content
    - Advertiser puts some Javascript on page and shares in revenue from ad clicks
  - Display ads
    - Advertiser negotiates with publisher for CPM (price) and impressions
    - Ad server (e.g. Doubleclick) serves up ads to pub server



# How do the publishers get ads?

---



# Publisher Workflow

---

- **Sign up with ad network**
  - e.g., Google, Turn Inc., Right Media (remnant inventory)
- **May be able to impose constraints on ads shown (e.g., size, border, adtype, category of ad)**
- **Insert adcode into target page:**
  - `<td> <div style = "margin: 0px 0px 0px 15px"> <script type="text/javascript">`  
`<!-- google_ad_client = "pub-7765547575367178"; google_ad_width = 120; google_ad_height = 90; google_ad_format = "120x90_0ads_al"; //2007-03-30: SiteToolCenter Link Unit google_ad_channel = "9582783989"; google_color_border = "F0F0F0"; google_color_bg = "F0F0F0"; google_color_link = "0033FF"; google_color_text = "000000"; google_color_url = "000000"; //--> </script> <script type="text/javascript" src="http://pagead2.googlesyndication.com/pagead/show_ads.js">`  
`</script> </div>`

Rubicon Video | Internet Advertising - the Rubicon Project - Mozilla Firefox

http://rubiconproject.com/files/flash/flash.php

BETA | Logged in as: demo2

MY ACCOUNT ? HEL

rubicon PROJECT

SITES NETWORKS REPORTS

My Sites

Search:  Add

Rubicon Demo  
http://www.rubiconproject.com  
4 zone(s)  
Leaderboard (728x90)

Get Site Tags

Select all the Zones and Sizes below, and then click Get Tags to retrieve the Site Tags for your site.

Get Site Tags

You can put these tags on your site immediately; it usually takes about 20 minutes before you will start seeing ads.  
Note: You cannot put more than 3 Google tags on a page (this includes any Google tags you put directly on your site).

```
<!-- Rubicon Project tag -----  
Site: Rubicon Demo   Zone: My Site   Size: Leaderboard (728x90)  
----- -->  
<script language="JavaScript" type="text/javascript">  
var cb = Math.random(); var d = document;  
d.write('<script language="JavaScript" type="text/javascript">');  
d.write('src="http://optimized-by.rubiconproject.com/a/2001/2001/2002-2.js?cb='+cb+'">');  
d.write('<\scr'+ipt>');  
</script>  
<!-- end Rubicon Project tag -->
```

# Publisher Page with Ads

enjoy!  
[www.whitesandresort.com](http://www.whitesandresort.com)

## Phan Thiet Hotels

Find the lowest price on great hotels. Book Now!  
[PhanThiet.OneTime.com](http://PhanThiet.OneTime.com)

## Kiteboarding clearance

Kitesurf instruction, tricks and tips from a professional, online!  
[www.kitesurfinginformatic.com](http://www.kitesurfinginformatic.com)

Ads by Google

## Best Kiteboarding

Low Prices from the World's Largest Kiteboarding Company  
[www.bestkiteboarding.cc](http://www.bestkiteboarding.cc)

or local children drowning.

The yearly [Le Fruit Triathlon](#) is held in Mui Ne on June 1, and includes swimming, running and mountain biking.

## Surfing

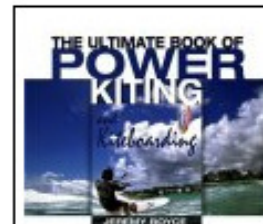
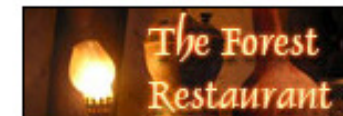
Mui Ne offers a relatively safe environment for low-key surfing. (see [kiteboarding](#) below).

## Scuba Diving and Snorkeling

The Best diving in [Binh Thuan](#) Province (or all of Vietnam for that matter) is at Ca Na Beach. The water is clear, the coral reefs are pristine, and the whole area is bursting with marine life. One thing Ca Na is lacking is very many tourists and the resorts to contain them. [Vietnam Scuba](#) has a very "for Koreans, by Koreans" diving establishment there. The website has some English, but we have not confirmed if anyone on staff speaks English fluently. [Click here](#) to read more about the [scuba diving](#) potentials at Ca Na Beach and the Hon Cau-Vinh Hao Proposed Marine Protected Area. Though all but undiscovered, [Phu Quy Island Proposed Marine Protected Area](#) also has a potential for scuba diving and snorkeling in coral reefs (but beware of sharks!).

From time to time, shipwrecks are discovered and salvaged off the coast of Binh Thuan Province. In the summer of 2004, three tonnes

S.T.K. CENTER  
KITESURFING &  
WINDSURFING



[The Ultimate Book of Power Kiting and...](#)

Jeremy Boyce

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or Buy New \$13.57

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[Privacy Information](#)



# Outline

---

- Introduction
- Online advertising background
- Business models
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- Summary

# Outline

- Introduction
- Online advertising background
- Business models
- Creating an online ad campaign
- Technology and Economics
  - Advertisers (optimizing ROI thru ads and ad placement)
  - Publishers (optimizing revenue and consumer satisfaction)
    - Forward Markets
    - Auction Systems
    - Estimating CTR (CPC, and CPA)
    - Budgeting
- New Directions
- Challenges in online advertising
- Summary

$$Bid_{Ad}$$

$$Bid_{Ad} * CTR_{Ad}$$

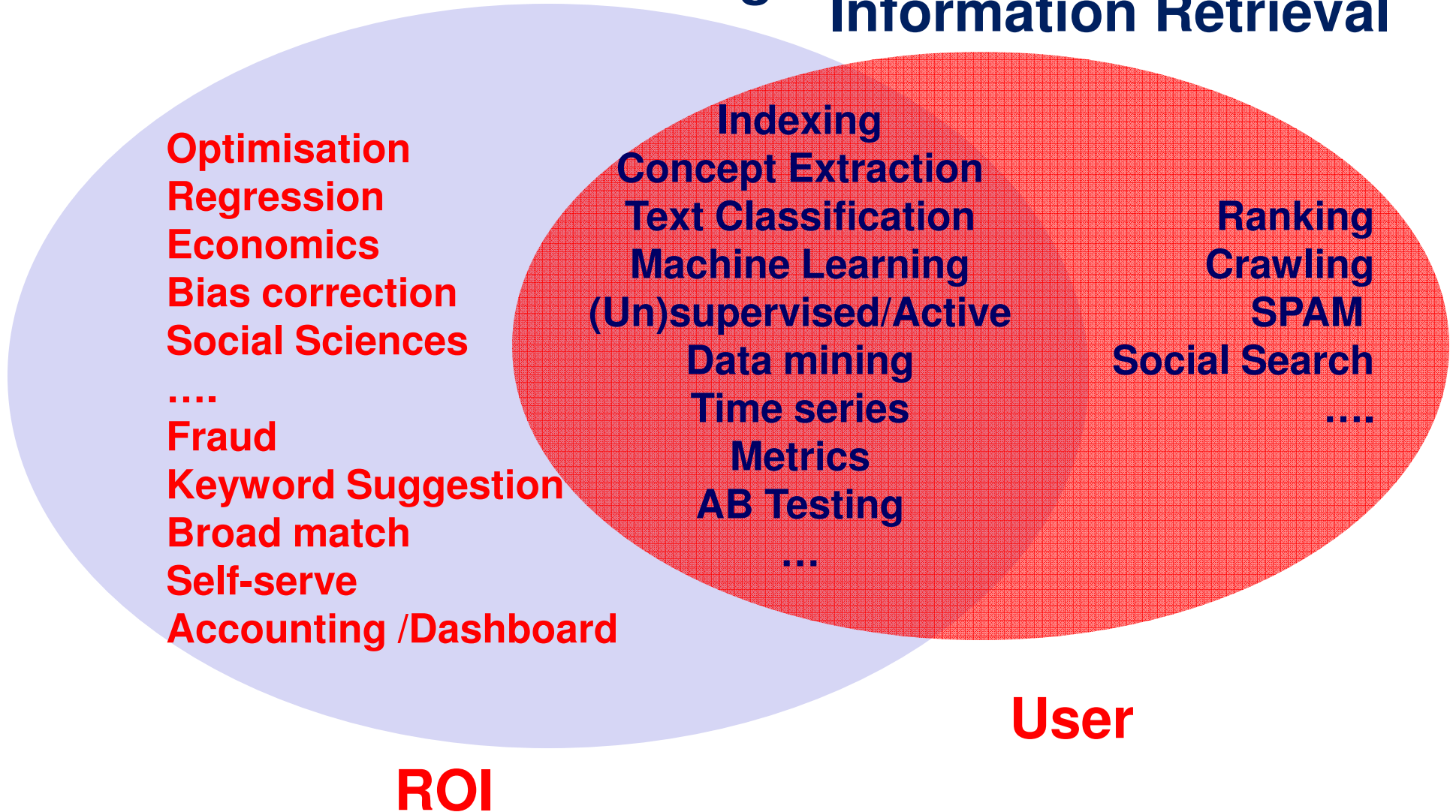
$$Bid_{Ad} * CTR_{Ad} * ThrottleFactor$$



# Online Advertising versus IR

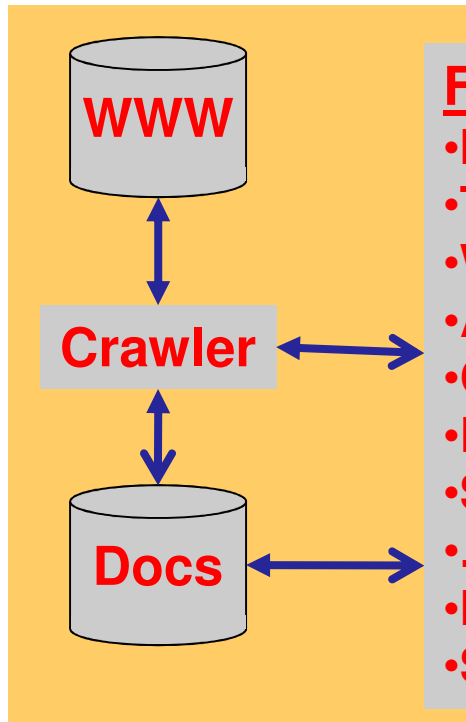
**Online Advertising**

**Information Retrieval**



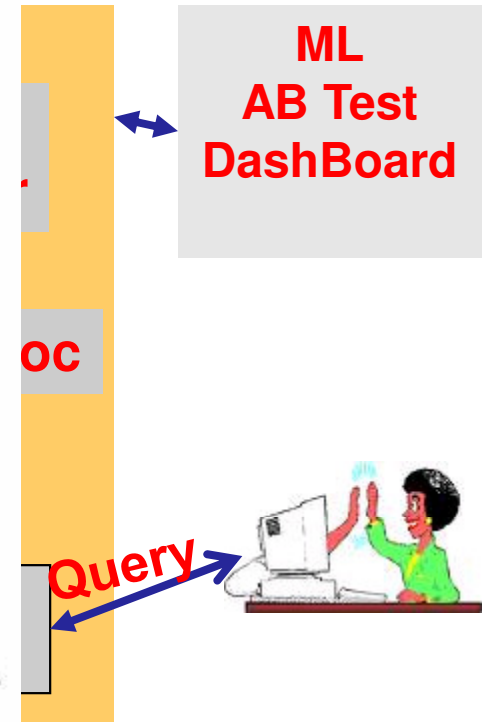
# Search Engine Architecture

## Index



- Offline Process
  - crawling, fe
- Online
  - query rewri
- Realtime web ir
- ML Framework

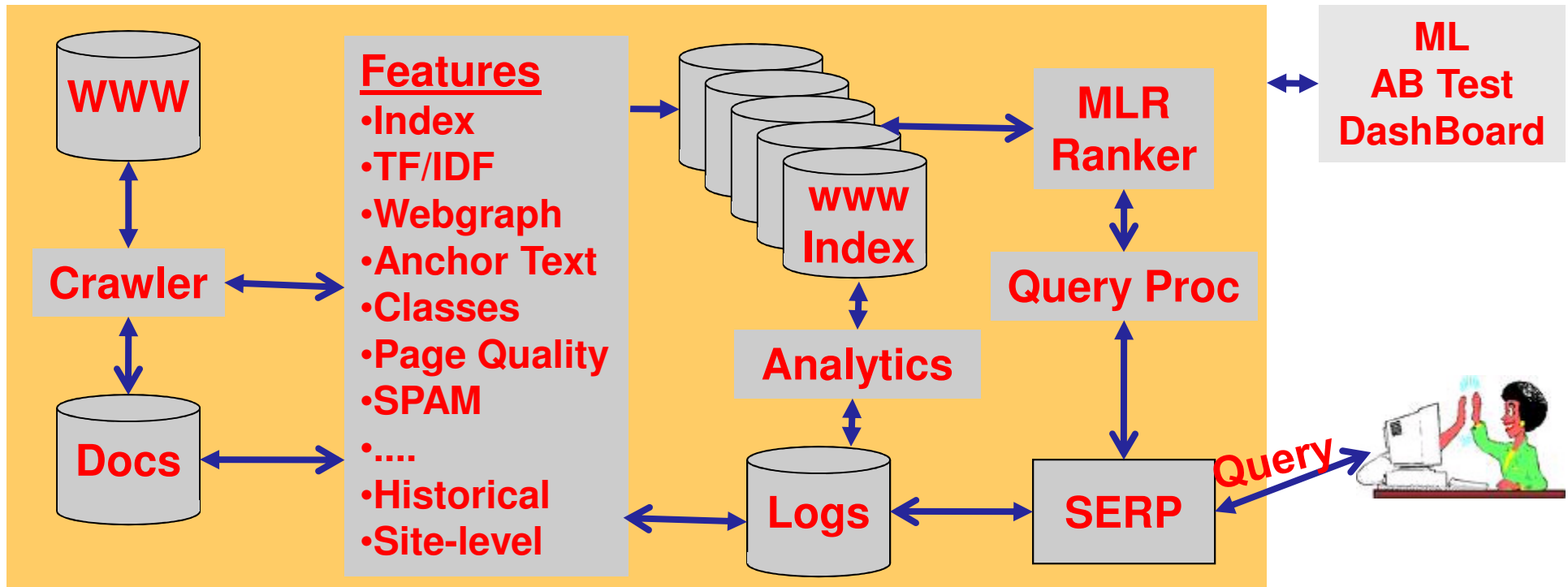
Abernathy, William, 36–37, 38, 47, 197–199  
 Acheson, Dean, 47, 291  
 Acme Cleveland, 312  
 action principle, 13–14, 17, 119–155, 320  
     communication in, 121–123  
     environmental support for, 145–150  
     experimentation as, 134–154  
     flexibility in, 121–125  
     learning process in, 143–145  
     numbers in, 141–143  
     orientation for, 154–155  
     project teams in, 131–134  
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dating ML models

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# Search Engine Architecture



- **Offline Processes**
  - crawling, featurizing, Webgraph, Classification, updating ML models
- **Online**
  - query rewriting, ranking, reranking, merging, logging, analytics
- **Realtime web indexing**
- **ML Framework**