Online Advertising: Paid Search Deep Dive

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Agenda

- Session 1
  - Online Advertising- An Overview
  - Search Advertising
  - How it works?
- Session 2
  - Paid Search- Deep Dive
- Wrap-up
  - Some Challenging Problems
  - What can you do to learn more?

Session 1

Online Advertising- Overview

Safe Search - On

28,100,000 results for
hotels in seattle:

- Show All
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travel.yahoo.com

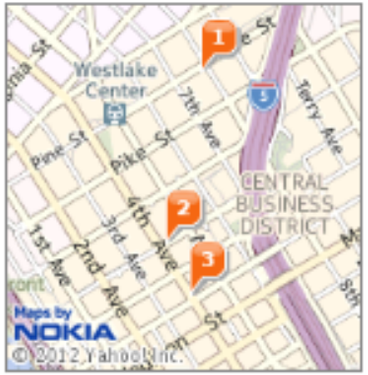
Under $100 | $200 | $300

1 Grand Hyat... ★★★★½ (43 Reviews) From $305
2 The Fairmo... ★★★★½ (33 Reviews) From $357
3 Hotel Mona... ★★★★½ (35 Reviews) From $339

More Hotels in Seattle»

Check-in 7/11/2013 | Check-out 7/17/2013 | Guests 1 | Find Price

More Booking Options »



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28,100,000 RESULTS

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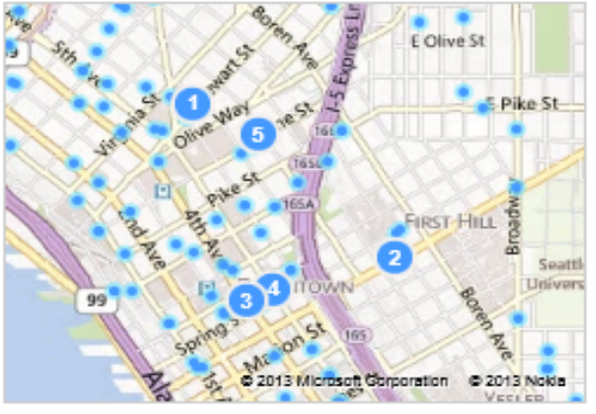

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Online Advertising

What is online advertising?

Online Advertising

What is online advertising?

Simply put= "Advertising delivered via the Web or other digital media"

Otherwise, very similar to traditional advertising

- The integration of marketing, planning, and strategy with technology
- Used to target messages to advertisers' customers or prospects

Why online?

- Short lead times
- Targeting
- Immediate results
  - Ability to refine quickly if needed
- Brand Interaction
  - Direct
  - Seamless experience between exposure to ad and action
- Drives offline sales
  - Consumers research online before they buy
  - Timely information both pre- and post-buy

Is Online Advertising Intuitive?

- First of all, it is any other advertising, targeted to consumers like us
- Parallels with supply-demand optimization
  - Supply: Pages where ads are shown
  - Demand: Ads that are shown
- Parallels with retail stores (multi-category)- think of Walmart, Macys, Target, Shopper's Top, Lifestyle
  - Retail Mantra- "right product in the right store at the right time in right quantity at right price"
  - Online Advertising – "right product to the right user at the right time"

Advertiser's Objective

Performance/ Direct

- Invites visitor to contact advertiser directly
- Measures of Success:
  - Frequency of visitor taking desired action
  - Clicking, purchasing, signing up, etc.
- Direct Advertisers' Goals:
  - Drive sales or sign ups with efficiency
  - Minimize dollars spent per conversion
  - Maximized revenue from conversion

All said and done, it is all about ROI

Brand

- Sum total of company's identity
- Brand Advertisers' Goals:
  - Build awareness
  - Broad reach; exposure
  - How often and how many unique visitors see ads
- Brand Interaction

What are some types of Online advertising?

- Search, Display, Contextual, Mobile, Games, Video, Local

- Some parallels in offline world?

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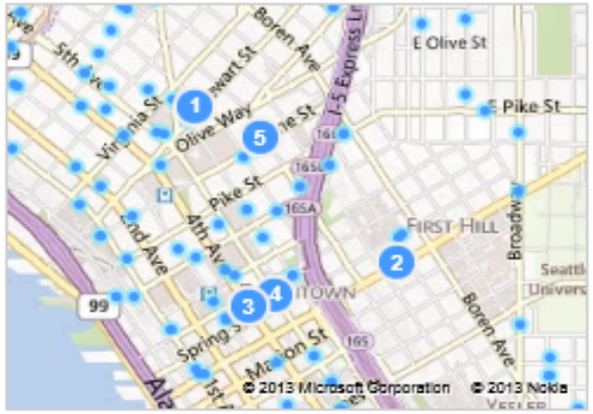

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THE TIMES OF INDIA

Thu, Jul 04, 2013 | Updated 12.45PM IST

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- Morsi's fall a blow to Islamists | In pics |
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- Egypt shuts down Islamist-run TV channels

Unravelling Ishrat encounter: How the conspiracy was hatched and who executed it

Prashant Dayal

The CBI will file a second chargesheet in the Ishrat Jahan encounter case on July 26 and there are expectations that some IB officers may be named then. |

- Gujarat police and IB killed Ishrat, 3 others: CBI |

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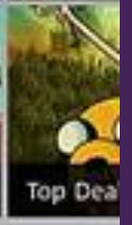

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Terminology you should be aware of

KPIs and More ..

- Performance vs. Brand
- Supply / Inventory/ Traffic
- Impression
- Demand (Ads)
- KPIs: CTR, Coverage, PVs, RPM
- Pricing Models: CPA, CPC, CPL, CPM
- Conversion Rate

Different Stakeholders

- Demand: advertisers, agencies, resellers, SEO, SEMs
- Platform: ad networks, ad exchanges, …
- Supply: Publishers, aggregators,
- Users

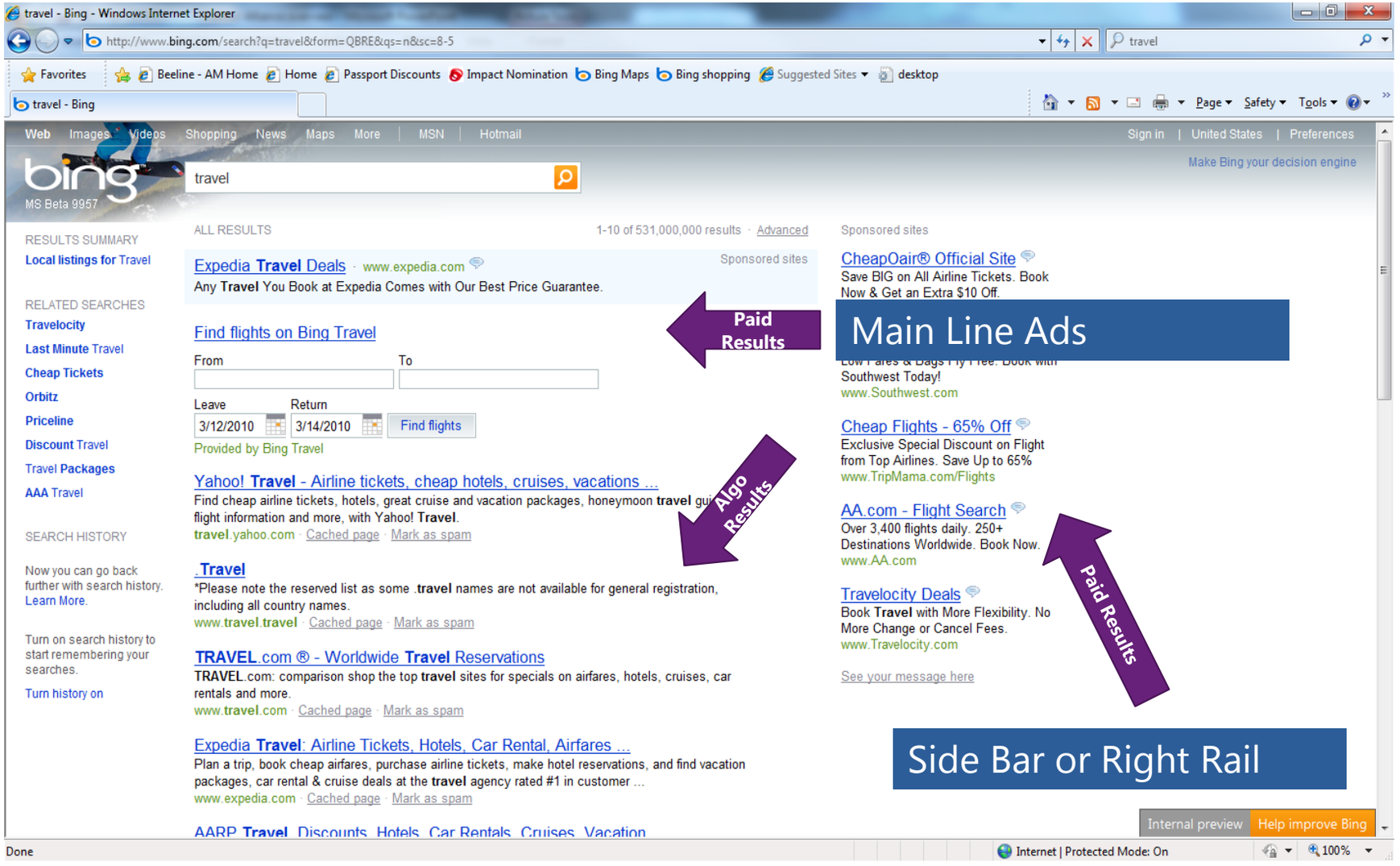
Search Ads Stakeholders..

http://www.lumapartners.com/lumascapes/search-lumascape/

SEARCH LUMAscape

Search Advertising

Search Overview : Algorithmic vs Paid Search



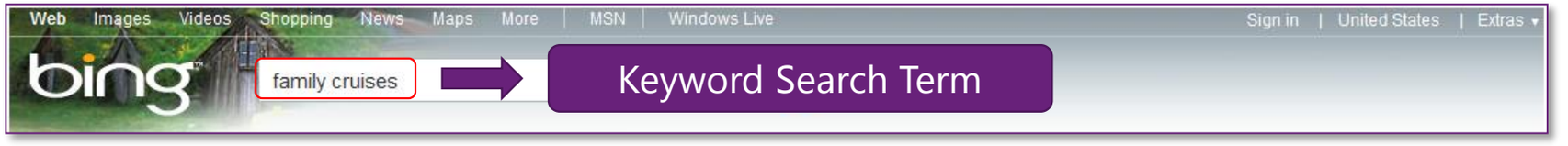
What is a Search Term?

Text a search user enters into a search engine's search box

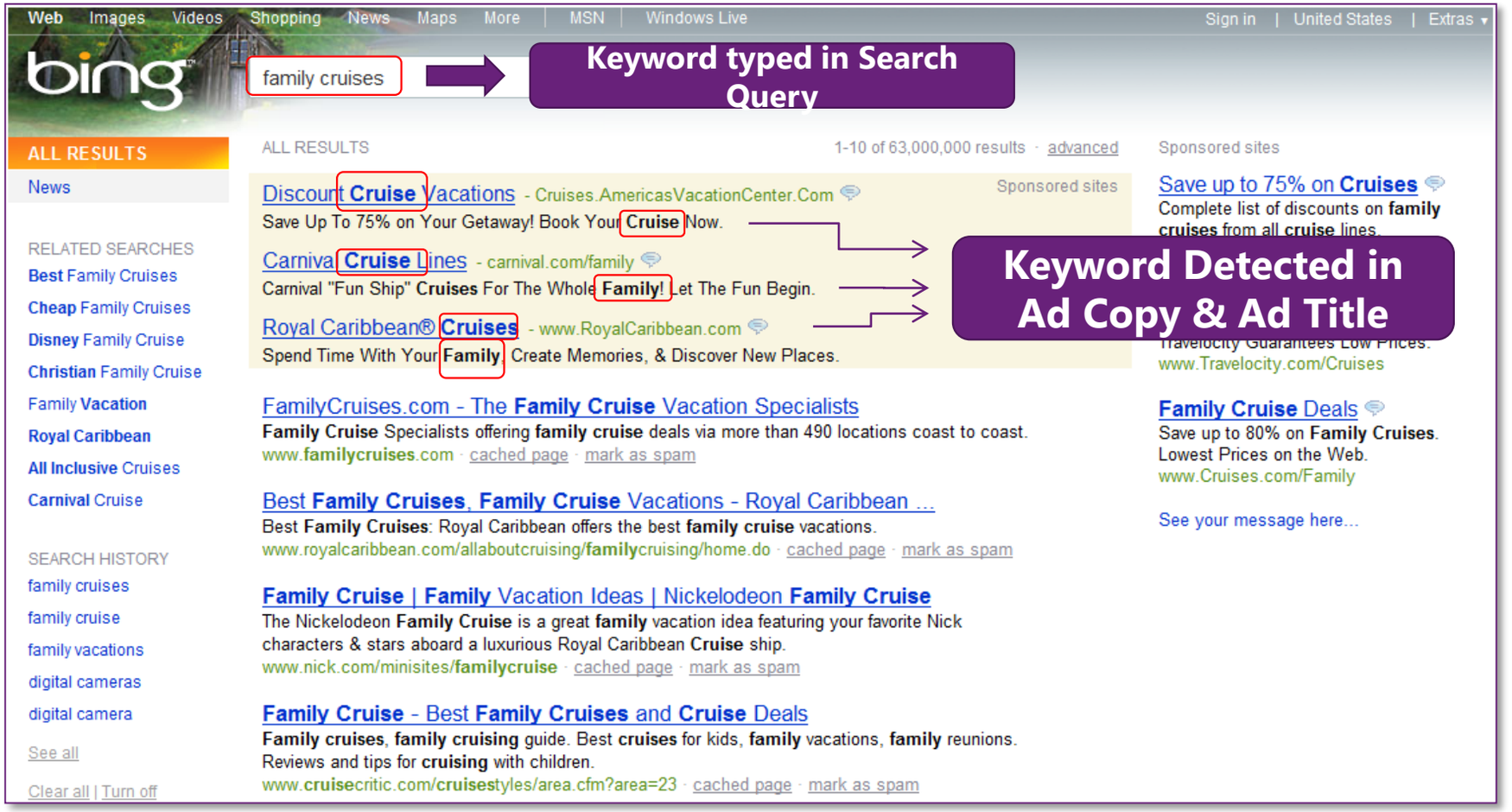
A Search Term can be:

- A single word or a group of words
  - Not necessarily from a dictionary (example: "adventurework")
- Numbers, or alphanumeric, or a collection of text characters (example: "area code 425")

Search terms are also commonly referred to as queries and query terms

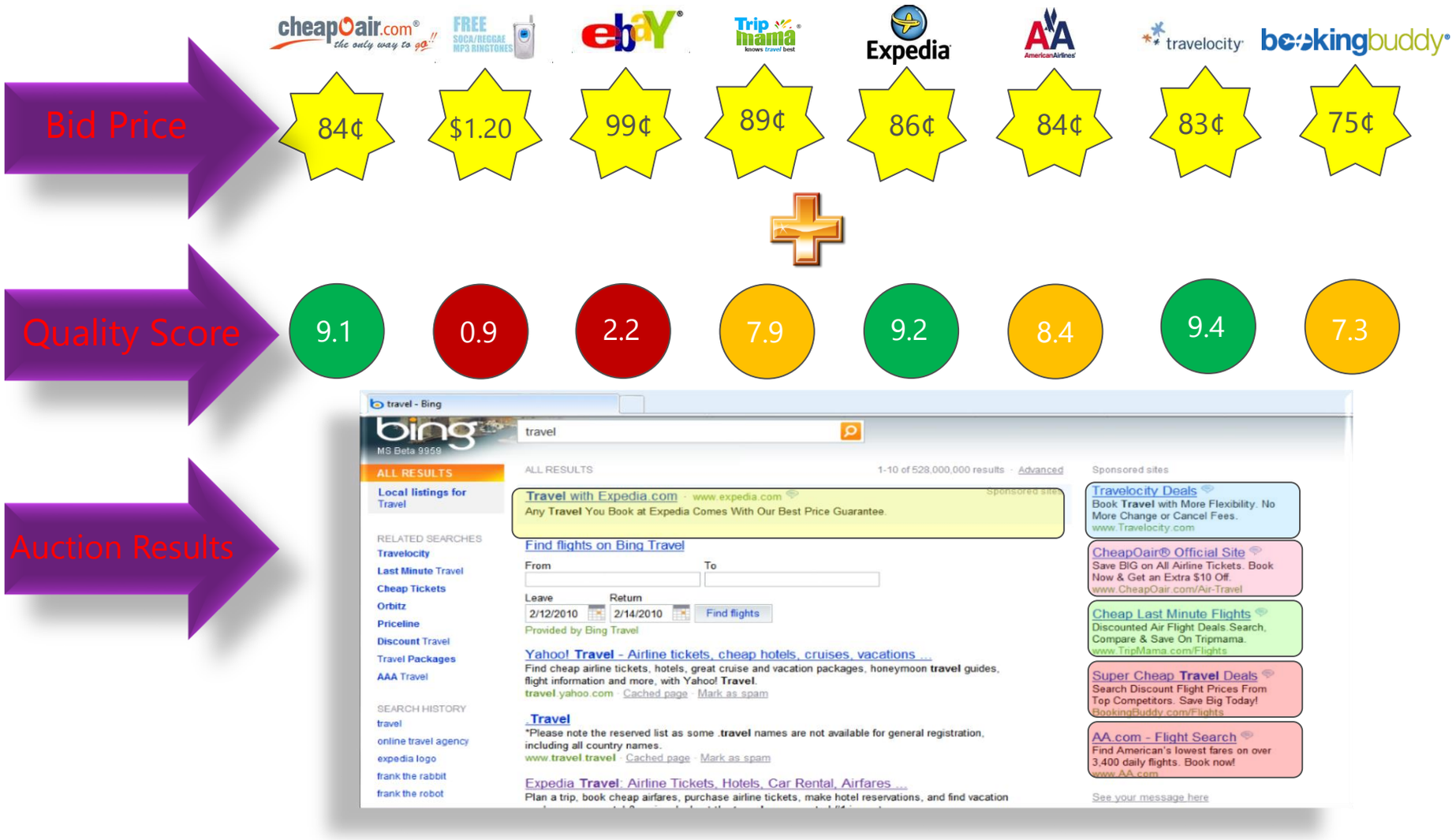


Search Results



Search Overview : The Paid Search "Auction"

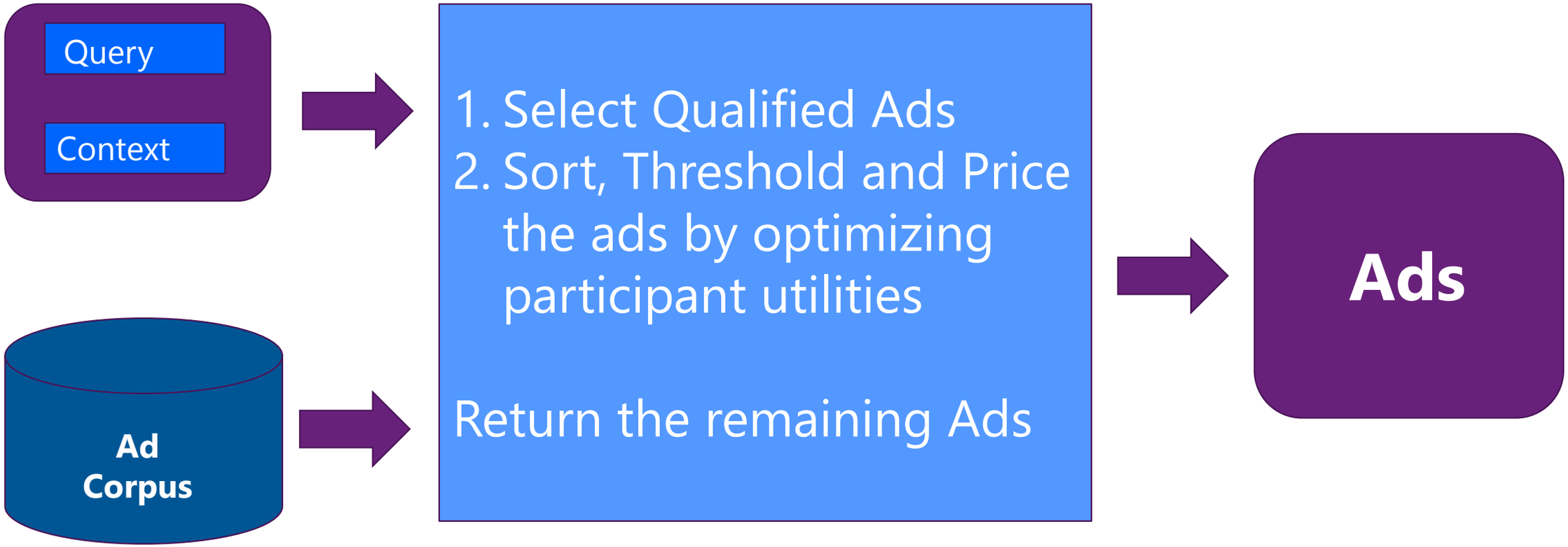
Search Overview : Paid Search Auction Simplified



Designing the Machine

Lets design the system…

Lets design the system…



Step 1: Selecting Qualified Ads

The most obvious approach

laptops

Keywords	Ads
car	{ads}
laptop	{ads}
laptops	..
....	..
cheap laptop	..
....	{ads}

Problems with this approach

- Very few ads get qualified from X-illions in the ad corpus
- Low impression and click volume, low prices
- Advertisers cannot guess and bid on all possible queries users search

➡ Opportunity to optimize utilities better

Step 1: Selecting Qualified Ads

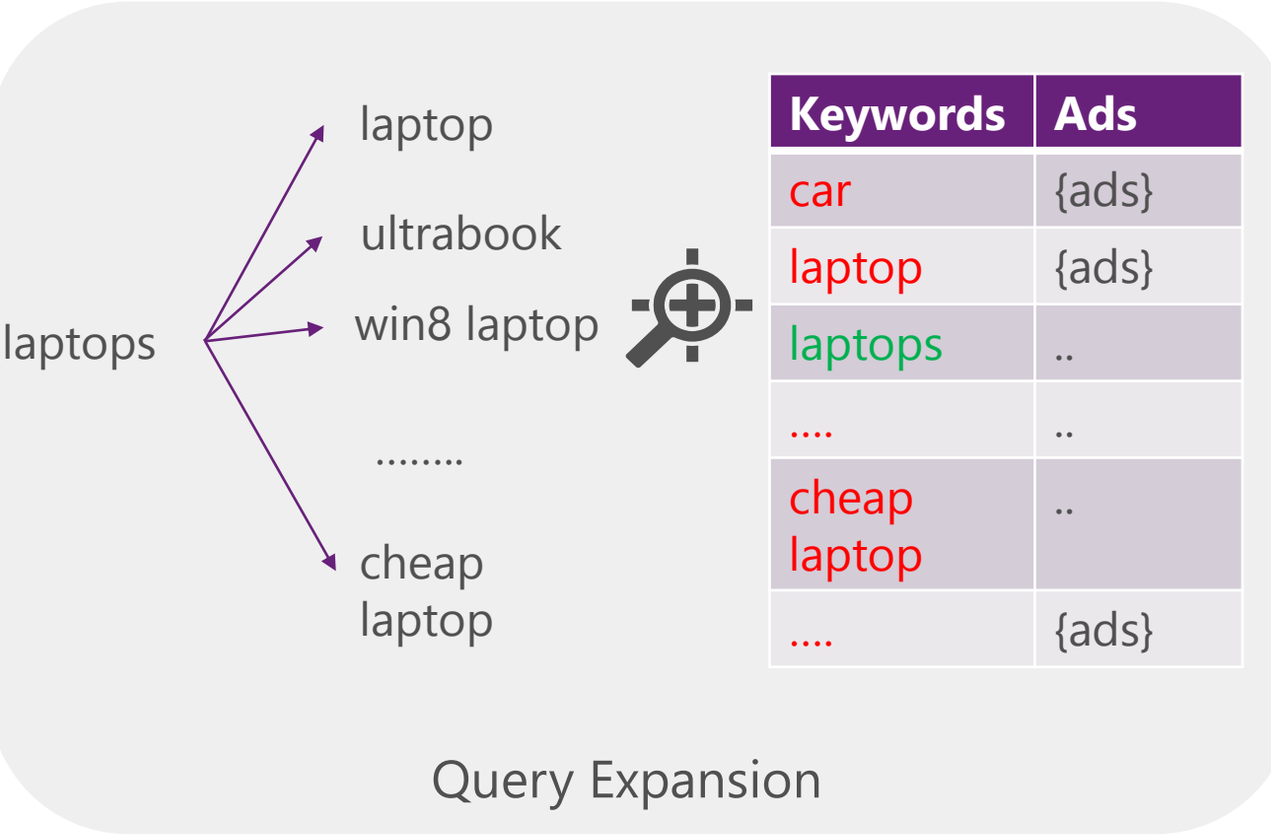
How do we fix this problem with the most obvious approach?

Query Expansion

f(laptops) = {laptop, ultrabook, macbook, cheap laptop, deals on laptop,..... }

Can you suggest a few ways to come up with this expanded list?

Keyword Expansion



Step 1: Selecting Qualified Ads

We selected a huge list of ads, but are all these qualified?

How do we qualify the ads?

Simple: Based on utility of the participants

User's Utility	Publisher's Utility	Advertiser's Utility
How?	How?	How?

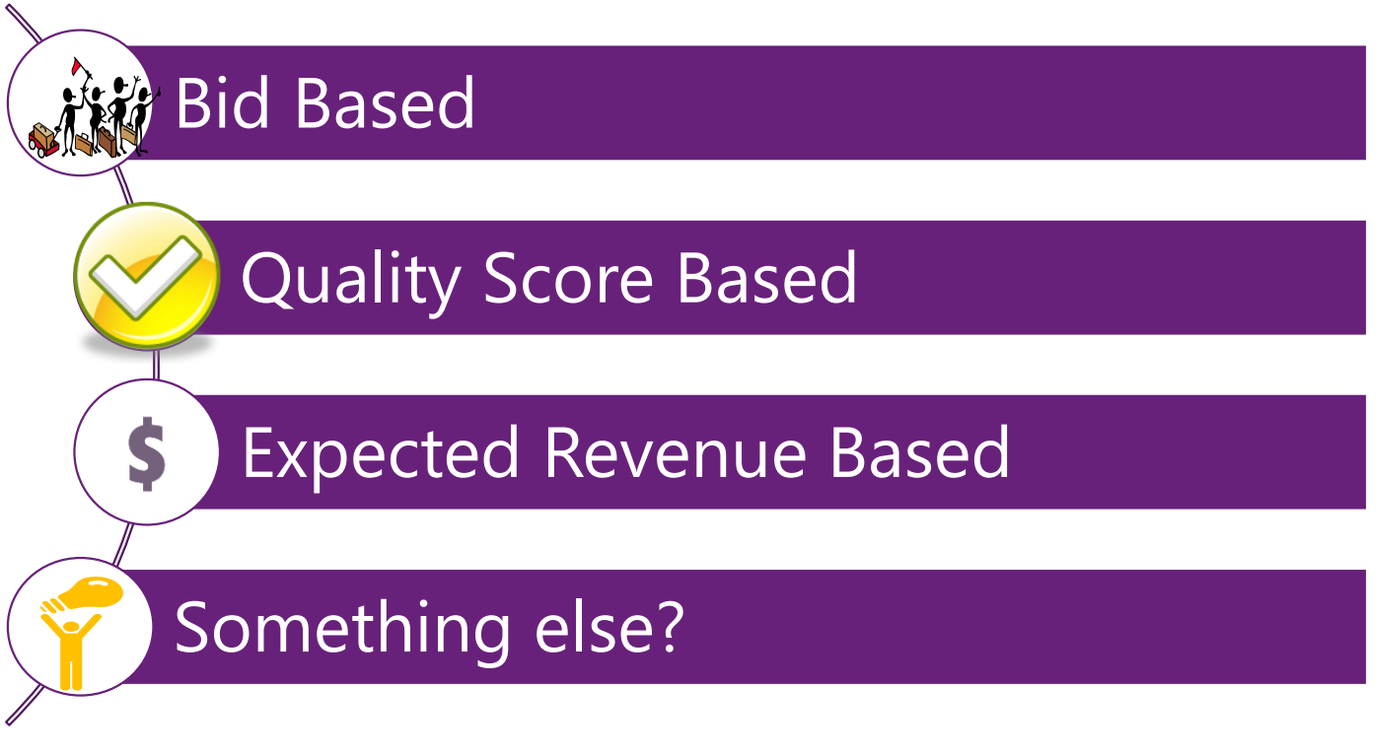
…from X-illions of ads in corpus, now we have '000 in hand

Step 2: Sort, Threshold and Price

From ‘000s, how do we select dozens?

Its as easy as sorting and picking from top. The million dollar (literally) question is how do we score for sorting.

?



Step 2: Sort, Threshold and Price

From a sorted list of ‘000s of Ads, how many ads do we serve?

- *As many as no. of slots?*

Step 2: Sort, Threshold and Price

From a sorted list of ‘000s of Ads, how many ads do we serve?

- ~~*As many as no. of slots?*~~
- *Maximize overall utility of the marketplace*

Step 2: Sort, Threshold and Price

How much should we charge for click?

To build a healthy market, pricing mechanism must ensure:

- Advertiser bid their true value
- Price is competitive
- Advertiser's RoI is positive

Formulation is typically a variation of GSP and this is evolving as we are talking!

The Gold Mine

- Multi billion dollar business, a small algorithmic improvement means tens of millions of dollars
- Wide play area – query expansion, ad qualification, scoring, pricing and many more areas that are all million dollars
- Wide play area – need expertise from diverse backgrounds e.g. computer science, machine learning, statistics, microeconomics, mechanism design, psychology, UI design

Sounds interesting?

Feel free to reach out to: dbapna@microsoft.com, ychouhan@microsoft.com

MarketPlace 101

Search Advertising Metrics

- Impressions
  - Number of times an online ad is delivered to web pages.

- Clicks
  - Clicks represent the number of times a potential customer clicked an ad displayed in SERPS for a given online advertising program.
  - The number of clicks can never be greater than the number of impressions.

- Click Through Rate (CTR)
  - Rate at which visitors view and subsequently click an ad.
  - Reflected as a percentage of impressions divided by clicks.

  - NOTE: A higher CTR percentage implies higher number of clicks as relates to the impression that were served. A lower CTR percentage implies higher number of impressions, but fewer clicks.

Search Advertising Metrics

- Cost per click (CPC)
  - A performance-based pricing model typically used for Search advertising.
  - CPC, pays publishers based on number of clicks on a specific ad.
  - Most ad networks only pay once per click per user within a specified time period, generally 24 hours or more.

- Cost per action (CPA)
  - An ad payment model in which advertisers pay only when an ad display leads to a completed sale, registration, download, etc.
  - Virtually all affiliate network advertising can be thought of as CPA-based.
  - Bing CashBack has a CPA Model.
  - Consumers get cash back when they buy eligible products and advertisers list their products at a fixed CPA and pay only for sales completed.

Key Performance Indicators

- Ad Click thru Rate (ACTR)
  - The rate at which an ad is clicked with respect to the total number of ad impressions
  - Ad CTR = Total Clicks / Total Impressions

- Price per Click or Cost per Click (PPC or CPC)
  - Revenue generated per ad click
  - PPC = Total Revenue / Total Clicks

- Revenue per Mille (RPM)
  - Revenue generated per 1000 searches
  - RPS = (Total Revenue / Total SRPV's)*1000

- Click Yield (CY)
  - Rate at which an ad is clicked with respect to the total # of Searches
  - Click Yield = Total Clicks / Total SRPV's

Elements to Success in Search

- Advertisers purchase keyword terms based on:
  - Traffic volume
  - Relevancy
  - Performance
  - Price
- AdCenter ranks Advertisers' terms based on:
  - Relevancy
  - Click-through Rate
  - Maximum Bid Amount

- AdCenter rewards the highest ranking Advertisers with:
  - Top positioning
  - Great converting users

How Google Makes 100M/day

http://searchenginewatch.com/article/2220372/How-Google-Rakes-In-Over-100-Million-in-Search-Advertising-Daily-Infographic

24 HOURS in the GOOGLE ECONOMY
Key Google Advertising Metrics for Q3 2012
Google Search
Google Display Network
HOW DOES GOOGLE MAKE OVER
$100 MILLION A DAY
WITH SEARCH ADVERTISING?
and Billions for Advertisers and the Economy!
Impressions are the total number of ads displayed
Daily Ad IMPRESSIONS per day in Q3 2012
5.6 BILLION
24.2 BILLION
AVERAGE COST PER CLICK in Q3 2012
$0.53
vs Q2 2012 % of change -16.5%
$0.35
-18.2% vs Q2 2012 % of change
vs Q2 2012 % of change -12.4%
3.47%
AVERAGE DAILY CLICKS in Q3 2012
0.18%
AVERAGE CLICK THRU RATE in Q3 2012
+13.8% vs Q2 2012 % of change
+21.6%
193.2 MILLION
44.7 MILLION
+29.1%
% of change from Q2 2012
AVERAGE CONVERSION RATE in Q3 2012
5.63%
4.68%
AVERAGE NUMBER OF DAILY CONVERSIONS
Completed Sales, Leads Generated, Etc. in Q3 2012
10.9 MILLION
2.1 MILLION

Categories of Business

Travel

Shopping

Finance

Internet and Telecom

Jobs & Education

Computers and Electronics

Home and Garden

Business and Industrial

Beauty and Fitness

Auto and Vehicles

1. FINANCE

Daily Stats for Q3*	Google Search	Google Display Network
Ad Impressions	617 M	5.32 B
Click Thru Rate	3.67%	0.10%
Number of Clicks	22.7 M	5.24 M
Cost Per Click	$3.09	$1.03
Conversion Rate	6.12%	5.12%
Completed Sales**	1.39 M	268 K

Highest CPC

Most Conversions per day

TOP 5 ADVERTISERS in Finance in Q3 2012

1. StateFarm
2. GEICO
3. Quicken Loans
4. Capital One
5. Bank of America

2. TRAVEL

Daily Stats for Q3*	Google Search	Google Display Network
Ad Impressions	345 M	2.14 B
Click Thru Rate	4.88%	0.18%
Number of Clicks	16.8 M	3.89 M
Cost Per Click	$0.29	$0.28
Conversion Rate	1.45%	2.99%
Completed Sales**	244 K	116 K

Lowest conversion rate

TOP 5 ADVERTISERS in Travel in Q3 2012

1. Expedia
2. hotels.com
3. BOOKING.COM
4. priceline.com
5. KAYAK

3. SHOPPING

Daily Stats for Q3*	Google Search	Google Display Network
Ad Impressions	232 M	1.21 B
Click Thru Rate	5.23%	0.23%
Number of Clicks	12.1 M	2.81 M
Cost Per Click	$0.25	$0.27
Conversion Rate	3.58%	2.19%
Completed Sales**	434 K	61.4 K

Highest CTR

TOP 5 ADVERTISERS in Shopping in Q3 2012

1. amazon.com
2. ebay
3. JCPenney
4. Walmart
5. sears

4. JOBS & EDUCATION

Daily Stats for Q3*	Google Search	Google Display Network
Ad Impressions	660 M	2.06 B
Click Thru Rate	1.72%	0.13%
Number of Clicks	11.3 M	2.62 M
Cost Per Click	$1.80	$0.34
Conversion Rate	6.09%	2.09%
Completed Sales**	690 K	54.8 K

Most Ad Impressions

Lowest CTR

TOP 5 ADVERTISERS in Jobs & Education in Q3 2012

1. University of Phoenix
2. monster.com
3. ITT Technical Institute ITT
4. DeVry
5. KAPLAN UNIVERSITY