Digital Advertising and Marketing: A review of three generations (Part 1) (Part 2: on Friday, April 13)

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Lecture 5, Wednesday February 15, 2012

Outline (today and Friday, April 13)

Introduction
- Advertising: supply-demand market place
  - Business models, Ecosystem, Market statistics
- Advertiser/Publisher Workflow
- Technology and Economics
  - Forward Markets (Operations research)
  - Spot Markets (ML, IR, Ranking, SNA, Quany)
  - Auction Theory and Game Theory
- New Directions
  - BT, Mobile, Video, Social
- Challenges in online advertising
- Summary

Executive Summary

- Advertisers deliver a message to consumers via publishers
- Online advertising revenue growing annually (double digits)
  - €14.7Billion in Europe, €16.3B ($23B) in USA (2009), €44B (665B) worldwide
  - 10% of overall ad spend corresponds to online advertising
- Business Models: CPM, CPC, CPA, dCPM
- Online advertising is dominated by search, display, social and mobile
- Key directions
  - Paid search drove the first shift in the early 2000s, rapidly transforming the web and creating/enabling previously unworkable business models. In the coming decade, social, as a category, is poised to do the same thing.
  - Forward markets: Spot Markets
- Technology: Economics, IR, ML, OR, Game Theory, Stats, Social Sciences (estimating CTR/AR, auction systems; learning algorithms; targeting display advertising; behavioral targeting; social advertising)
- New Directions: Web 3.0; games; social advertising; exchanges
- Gap: perceived gap between academia and industry?

Brief Bio James G. Shanahan

- 20+ years in the field AI and information management
- Principal and Founder, Boutique Data Consultancy
- Clients include: Adobe, Digg, SearchMe, AT&T, Ancestry, OfferPal,
- Teach at University of California Santa Cruz (UCSC), ISM 209, 250, 251
- Previously
  - Chief Scientist, Turn Inc. (a CPX ad network, DSP)
  - Principal Scientist, Clarivoyance Corp (CMU spinoff; sister lab to JRC)
  - Research Scientist, Xerox Research; cofounder of Document Souls
  - Research Engineer, Mitsubishi Group
  - PhD in machine learning (1998), University of Bristol, UK; B.Sc. Comp. Sci.

Marketing versus Advertising

- Advertising:
  - The paid, public, non-personal announcement of a persuasive message by an identified sponsor; the non-personal presentation or promotion by a firm of its products to its existing and potential customers.
  - Advertising is a single component of the marketing process.
- Marketing:
  - The systematic planning, implementation and control of a mix of business activities intended to bring together buyers and sellers for the mutually advantageous exchange or transfer of products.
  - Marketing Pie: advertising, market research, media planning, public relations, product pricing, distribution, customer support, sales strategy, and community involvement.
- Expensive wise:
  - Advertising > public relations > market research

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- Living vicariously!
Lecture 5: Schedule

- 2:00-3:05 Digital Advertising (Jimi)
- 3:10-3:35 Social Game Analytics
  Raj Pai, CEO, and Jay Bala, CTO, Claritics
- 3:35-4:00 Knowledge Fusion for Computational Marketing
  Lokendra Shastri, VP, Analytics, Infosys

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. Branding \rightarrow Direct action
    - 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. Use every major medium
    - To deliver these messages, including: television, radio, movies, magazines, newspapers, video games, the Internet, and billboards

Digital Advertising

- 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. [Credit assignment]
  - "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
  - A: Deliver/push an advertiser’s message with quantifiable measures of consumer interest
  - A+P: Generate ROI for the advertiser and revenue for the publisher
  - P+C: Enable ads as a medium of information (true in the case of search)

Advertising makes up ~2% of US GDP

"Half the money I spend on advertising is wasted; the trouble is, I don’t know which half." - John Wanamaker, father of modern advertising.

Less than 1% of all impressions lead to measureable ROI

- Despite its problems (Attribution etc.)
  - US GDP = $14.1 Trillion (Global $56 Trillion, 56x10^{12})
  - US Advertising Spend
    - ~$275 Billion across all media
    - (2% of GDP since the early 1900s)
  - In 2008, Worldwide online advertising was $65B
    - I.e., about 10% of all ad spending across all media [IDC, 2008]
    - $23 Billion in US; $2 Billion in China; 2Billion in Latin America;
    - $208 (Europe); and Russia accounted for $720 million

Europe versus USA

![Total online ad spend Europe vs USA 2008 & 2009](image)

- Western Europe ad spending was $18 billion US Dollars ($14.7 billion Euros) in 2009 or 27% of global online ad spending;
- The US revenue was $22.7 billion;
- Latin America ad revenue was $2 billion;
- China had a similar revenue of $2 billion;
- $2 billion in Latin America; and
- Russia accounted for $720 million
Ad Spend Across Europe and Russia

- Share of total spend by country (Million Euros)
  - UK: €4,211 (27%)
  - France: €4,768 (9%)
  - Germany: €3,782 (21%)
  - Russia: €3,143 (3%)
  - Spain: €1,056 (6%)
  - Italy: €793 (4%)
  - Norway: €667 (3%)
  - Sweden: €667 (3%)

Source: J295A: Thought leaders in data science and analytics © 2012 James G. Shanahan James.Shanahan_AT_gmail.com

Ad Spending Breakdown in US

- Sponsored search accounts for 47 percent of 2009 full year revenues ($10.7 billion);
- Display-related advertising revenues totaled $8.0 billion;
- Classifieds revenues (products such as YellowPages.com) accounted for 10 percent or $2.3 billion;

[IAB Report 2010]

Search And Display Advertising Growth

- Doubling in 4 years
- Big international growth

Source: J.P. Morgan estimates

Reach in terms of users and minutes

- Facebook’s Expanding User Reach
- FB Minutes Surpass Yahoo’s

Traffic Source

- Mainly due to Facebook Connect (single login; seamless experience)

Average user is spending 2 hours a day online
Google Generates 6X Revenue per user than Facebook per year

Google Generates 6X More Revenue per User than Facebook

Google

Tencent

Baidu

Facebook

Google

Tencent

Baidu

Facebook

Q4, 2010

http://www.visualeconomics.com/how-the-world-spends-its-time-online_2010-06-16/

60 Hours per month online

Most Visited Sites Worldwide for 2/2011

(Excludes porn, and some of Google)

Big lag in ad dollars spend online

- Typically ad dollars have followed media consumption
- Despite people spending more time on the internet, there is a $40 billion deficit (in US)

Why the big lag in ad dollars spend online?

- Advertisers and agencies are old fashioned
  - Don’t use mathematically sophisticated systems; human experts
  - Advertisers are broadcast oriented (TV, Newspaper, Radio etc)
  - Huge culture change
    - Real-time versus weekly/monthly
    - They speak the language of audiences and panels (not data mining, machine learning); social scientists
- Accountability: Internet is still relatively new and largely unknown
  - Apart from sponsored search (3.5% of online activity) other media types are largely not accountable (credit assignment) and underexploited; (in US $14B versus $8B)
  - Poor targeting
  - Guaranteed markets at spot market prices
- Huge opportunity if history is anything to go by and ....

What marketers want?

- Deliver marketing messages and attract customers and sell products/services
**Purchase Funnel**

- **Awareness**
  - Targeting Demo, Geo and Content related websites
  - SEM: User who is searching for your product
  - Site Retargeting: Users who previously visited your website
  - User who is on your visited website

**Advertising Stone Soup: Core Skills**

- Advertising systems can be basic (stone soup) but adding:
  - IR, Nonlinear programming, ML, Econ, Game Theory
  - Gradient descent, Objective functions, probabilities, statistics, analytics, visualization
  - Hacking
  - Large data
  - Will make even better!

- The Portuguese dish of sopa de pedra (stone soup).


**Advertising Planning Process**

- Brand Positioning
- Target Market
- Advertising Objectives
- Budget Decisions
- Creative Strategy
- Media Strategy
- Campaign Evaluation

**Advertising Objectives**

- Create awareness for new products
- Inform consumers
  - of product features and benefits
  - price changes
  - Important for building primary demand
- Persuasion
  - Build brand preference or change buyer perceptions
  - especially important for building demand in competitive markets.
- Reminder advertising: maintain top-of-mind awareness

**Hierarchy of effects Communication Process**

- Awareness
- Interest
- Liking, Preference
- Purchase, Action

Good advertising creative strategy translates the brand’s positioning statement into a persuasive and memorable message. A great creative will provide lasting impact even if advertising budgets are constrained.

**What marketers want?**

- Deliver marketing messages to customers
  - Buy products/services (long term vs. short term)
- Goal
  - Introduce: Reach
  - Influence: Brand
  - Close
  - Network Effect
- Activity
  - Media Planning
  - Ad Effectiveness (CTR, site visits)
  - Marketing Effectiveness (Transactions, ACR, Credit Assignment)
  - Referrals/Advocacy
Online Marketing Goal/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

Marketing Objectives vs. Advertising Stages

<table>
<thead>
<tr>
<th>Stages</th>
<th>APR-Media Model</th>
<th>Questions Assessed</th>
<th>Metrics and Typical Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Getting the Opportunity to Communicate the Message</td>
<td>Vehicle Distribution - Value Proposition - Advertising Exposure</td>
<td>Reach - Frequency Sources - Audience awareness - reach and frequency</td>
<td></td>
</tr>
<tr>
<td>2 Building Brand and Message Awareness</td>
<td>Advertising Attitudes - Advertising Communication</td>
<td>Brand survey - Awareness Sources - Ad-Building committees - reach and frequency</td>
<td></td>
</tr>
<tr>
<td>3 Increasing Behavior and Message Awareness</td>
<td>Advertising Persuasion - Advertising Response - Sales Response</td>
<td>A variety of behavior metrics - Value Proposition - Awareness - reach and frequency</td>
<td></td>
</tr>
<tr>
<td>4Cashing Behavior</td>
<td>Advertising Response - Sales Response - Value Proposition</td>
<td>CPA = Spend/Transactions</td>
<td></td>
</tr>
</tbody>
</table>

Parallel with existing media
1. Print<>webpages
2. Direct Response<>interactivity
3. TV<>online video

Advertising Planning Process

Advertising Objectives
Brand Positioning
Target Market
Budget Decisions
ROI
Cost
Creative Strategy
Media Strategy
Campaign Evaluation

Advertising: ROI is King
(in French and in Advertising)

CPA = Spend/Transactions

Advertising: ROI is King
(in French and in Advertising)

CPA = $4/1 = $4
Marginal cost

CPA = $3/2 = $1.5

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.

Advertisers: ROI versus CPM

<table>
<thead>
<tr>
<th>Media Type</th>
<th>CPM</th>
<th>ROI per $1 Spent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outdoor</td>
<td>5-5</td>
<td></td>
</tr>
<tr>
<td>Cable TV</td>
<td>5-8</td>
<td>$6.81</td>
</tr>
<tr>
<td>Radio</td>
<td>8-8</td>
<td>$8.60</td>
</tr>
<tr>
<td>Online</td>
<td></td>
<td>$19.83</td>
</tr>
<tr>
<td>Display (S-S)</td>
<td>5-30</td>
<td>$19.78</td>
</tr>
<tr>
<td>Sponsored Search</td>
<td>1-5</td>
<td></td>
</tr>
<tr>
<td>Social</td>
<td>0.2-5</td>
<td>$12.57</td>
</tr>
<tr>
<td>Mobile</td>
<td>0.2-56</td>
<td>$7.50</td>
</tr>
<tr>
<td>Email</td>
<td></td>
<td>$44.93</td>
</tr>
<tr>
<td>Network/Local TV</td>
<td>$20</td>
<td>$6.81</td>
</tr>
<tr>
<td>Magazine</td>
<td>$10-30</td>
<td>$10.11</td>
</tr>
<tr>
<td>Newspaper</td>
<td>$30-35</td>
<td>$12.77</td>
</tr>
<tr>
<td>Direct Mail</td>
<td>$250</td>
<td>$7.34-$15.38</td>
</tr>
</tbody>
</table>

[ROI based on DMA Power of direct marketing 2010 (UBAI)]

Advertising Planning Process

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Typical Ad Formats

- Ad Formats
  - Display
    - An advertiser pays an internet company for space to display a static or hyper-linked banner or logo on one or more of the internet company’s pages. For the purposes of this report all forms of internet sponsorship, tenancies, rich media formats have been included in the figure for display advertising.
  - Sponsored Search
  - Classifieds (e.g., online job boards and employment listings, real estate listings, automotive listings, yellow pages).
  - Other (e.g., newsletter advertising, email, mobile advertising and in-game advertising)

Ad Formats: popunder, image+text

Text Ads
- Display Ads
  - Graphical, Flash, Rich Media (sound, video)
  - Different sizes types:
    - For details see http://www.iab.net/standards/adunits.asp
  - Rectangular, RI and Buttons
- See IAB for standards

Ads Formats and sizes

(source: www.active responsegroup.com)
Ad sizes (See IAB)

Leaderboard 728 x 90 pixels
Wide Skyscraper 160 x 600 pixels
Medium Rectangle 300 x 250 pixels

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

Online Advertising for Video Content

- Pods: content (chapter), ads (break)
  - Ad pods: define durations and compositions of ad breaks
  - Pod format: linear vs non-linear (overlay)
  - Pod position: Pre-roll, mid-roll, post-roll
- User-level ad-pattern:
  - manage frequency of breaks to pace ad exposures
- Timeline for each video: insert cues to determine when ads are

Forms of Online Advertising

- Advertising online comes in all shapes and sizes and we run into it all the time be it through
  - Websearch
  - Reading the newspaper online
  - Paying the bills
  - Listening to music
  - Watching a video
  - Purchasing a book
  - Mobile device-based apps (phones, Tablet computers)

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

IAB Standards

Media Objectives
- Non-sponsored text (DFP Non-sponsored)
- Sponsored search (DFP Sponsored)
- Display Ad Network (DFP Display Ad Network)
- Programmatic Creative
- Private Label
- Native Advertising
- Interactive Advertising Bureau (IAB) Standards

Advertising Planning Process

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Sponsored Search

Google
• Selling in-game advertising tiles that had the ability to update over time

• It was a way that developers could tap into additional sources of revenue, along with keeping city based games more realistic.

From Mad Men To Wall Street and beyond!

<table>
<thead>
<tr>
<th>Banner</th>
<th>Click+Data</th>
<th>Personal</th>
<th>Social</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Set in New York City, Mad Men begins in 1960 at the fictional Sterling Cooper advertising agency on New York City's Madison Avenue.</td>
<td>• From Mad Men To Wall Street and beyond!</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Ads forads.com</td>
<td>• Set in New York City, Mad Men begins in 1960 at the fictional Sterling Cooper advertising agency on New York City's Madison Avenue.</td>
<td>• Social</td>
<td></td>
</tr>
<tr>
<td>• Technology</td>
<td>• Double digit growth</td>
<td>• Personalization</td>
<td></td>
</tr>
<tr>
<td>• Data</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Human Intensive</td>
<td>• 2007</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Lots of guesswork</td>
<td>• Data</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Forward Market</td>
<td>• Personalization</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Spot Markets</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Advertisers still in broadcast mode</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1st Generation 2nd Generation 3rd Generation

Bad Ad Placement? Moral Conscience

(Source: Neatorama.com) [Source: www.livingsweb.com]
Bad Ad Placement?

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

The 16-month-old boy died in the fire, and his two-year-old brother is in intensive care in the Princess Mira Hospital.

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

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

[Source: LivingWeb.com]

Key Trends

- Social will transform advertising as much as CPC did back in the late 1990s
- Sponsored Search is saturated
- Mobile is still embryonic
- Privacy is becoming a commodity

Outline

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

Formal Relationship between Adv and Pub

Advertiser wishes to reach consumers

Publisher has Ad Slots for sale

Consumers

Online Advertising

Advertiser-Publisher-User

User

Publisher

More egalitarian?

Ad

Ad

Select

Ad

Ad

Direct

Search

Engine

Ad Network

Ad Exchange, Etc.

Direct

Ad Agencies

Search Engine Marketers

Etc.
**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., Average CPM of $10; CPA of $1**

**Formal Relationship between Adv and Pub**

- **Ad Placement used to be simple circa late 90s**
  - **First Generation**
  - **Advertising: a supply-demand marketplace**
  - **From Mad Men To Wall Street and beyond!**
  - **2007**
  - **1st Generation**
  - **2nd Generation**
  - **3rd Generation**
Advertising: a supply-demand marketplace

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
  - An agency may represent many advertisers

Supply

Sponsored Search, Display Volumes

From Mad Men To Wall Street and beyond!

• Sponsored Search
  - 208 Billion in US (2009)
  - Display
2nd Generation

- Late 1990s
- Online payment models:
  - CPC, CPA business models
- Increasingly quant driven
- Supply can be fragmented → Ad Networks
  - Outside of search supply can be fragmented
  - Publishers maybe small and not have a sales team

Supply can be fragmented → Ad Networks

- Supply can be fragmented outside of search
- Publishers maybe small and not have a sales team
- Led to the development of different types of marketplaces
  - Publishers bring their produce for sale
  - Advertisers (or their representatives) come to buy
  - Ad Networks
  - ..., and later
    - Ad Exchanges, Yield mgt and Demand side platforms

Advertising Network: Aggregates Publishers

- Key function is the aggregation of ad space supply from publishers and matching it with advertiser demand.
  - Aggregate webpage space where online ads can be embedded and, in addition, providing both targeting and auctioneering capabilities.
- Ad networks were one of the first big directions taken to make this traditional market economy more efficient
  - they took an economy of scale task creating a huge marketplace that aggregated the supply of ad space from publishers
  - Advantage for advertisers
    - increased reach, reduced (economy of scale) pricing, reduced media-buying effort, targeting and analytics.

Ad Network

- Their sole objective
  - Optimize ROI for the advertiser and revenue for the ad network.
- Today over 350 ad networks
  - Some of the bigger ad networks include Google, Yahoo, and Microsoft.
  - DoubleClick (acquired by Google in 2007) was one of the first online ad networks, 1996-97 [http://en.wikipedia.org/wiki/DoubleClick].
Example Ad Network: Google

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

Yahoo and Google Ad Networks

- Sponsored Search Advertising
- Contextual Advertising
- Sponsored Search Advertising
- Contextual Advertising

3rd Generation

- New more efficient market places
  - Ad Exchanges
  - Data exchanges
- More intuitive demand and supply systems
- Ad Exchanges
  - Load with analytics and optimizations
  - Better Yields (yield mgmt)
- Audience-based targeting
- Mobile, Social
- Very complex pipeline

Publisher side: 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

Publisher-side Optimization Networks

- Yield Management Systems
  - Similar to airline industry software for pricing tickets and keeping track of available seats
  - If 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

Publisher, Ad Network, Ad Agency, Advertiser

Google properties, including:
- Google
- Froogle
- Gmail

Search partners, including:
- About.com
- Wikipedia
- The New York Times

ETC.
Yield Mgt.: Firmly in the supply side

As a publisher I can sell inventory...

• As a publisher (e.g., NYTimes, Google, MS) sell directly
  – 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 Publisher-side Optimization networks (Yield Managers)
  – Work directly with publishers; E.g., Pubmatic, Rubicon, AddKick
  – Select advertiser/network that offers best revenue
• Via Ad Exchanges (e.g., RightMedia.com, AdECN, AdX)
  – Remnant; Media aggregators with auction and primitive exclusion policies (e.g., no alcohol ads, may provide category of page/site)
• Via Ad networks (e.g., Google, Yahoo.com, Rocket Fuel)
  – Arbitrage and remnant;
  – Media aggregators and advertiser aggregators with targeting and auction mechanism

Best

The Network Stack (Display): Gen 2

From Mad Men To Wall Street and beyond!

Demand side: The Media Buyer’s nightmare

• (especially for trafficking display campaigns)
• In the past, if this media buyer (on behalf of the advertiser or agency) wanted to buy media, they would work with a provider like Right Media, ValueClick, Google or one of the tens of thousands of publishers and ad networks out there.
  – Ad buys were achieved by either inputting rules-based buying instructions on various fragmented interfaces, working with an account rep, or using an API to communicate with an ad server.
  – Once these buying instructions were defined, a provider would serve an ad, and make a buy, when an impression occurred on that particular network or site fit within the defined criteria.
The Media Buyer’s Nightmare: optimizing

- Media buyer would analyze, optimize
  - Buyers could then login to run reports, optimize campaigns or make minor tweaks and changes. Media buyers (and their clients) who needed mass impression inventory would have to perform this task over dozens, if not hundreds, of sources to achieve scale, since in this highly fragmented space no provider has a dominant share of the inventory.
- A big agency could work with as many as a thousand digital media vendors when you count the publishers, exchanges, ad networks, and intermediaries.
  - Suddenly, buyers were logging into numerous interfaces, pulling and collating disparate reports and are left trusting dozens of black boxes to run their ads in the right places. Very simply, the fragmentation in the display space made digital media buying a nightmare.
  - Moreover, the vendor was in control of where the ads ran, which inhibited transparency and targeting for the buyer.

Real-Time Bidding (RTB) Exchanges

- RTB changes the media buyer’s nightmare.
- Instead of each individual media buyer having to learn and rely on a incongruous collection of their vendors’ ad software, they can instead use a single DSP (defined in a moment) to manage buying all in one place.
  - This (DSP) single platform aggregates multiple inventory sources, making it possible to target very narrowly defined audience segments at scale using a single standard without fear of overlap.
  - Buyers can now use data they have collected and developed about their customers’ target users and communicate with those users directly as individuals.
- The modes of buying shift from targeting inventory sources to targeting individual users, and in turn, audiences.

Ad Exchange: auctioneer-centric marketplace

Demand Side Platform (DSP)

- At its core, a DSP is software for transparent automated media buying across multiple sources using unified targeting, data, optimization and reporting.
- Empowering advertisers thru DSPs connect the data dots and buy audiences

User Browses a Webpage

The first thing to note is that the entire process is driven by the browser and not by either the publisher, network or agency adserver. Each time one party passes off the ad-request it’s sent off to the next; there is no impression level feedback loop or communication between the three serving systems.
Real time Bidding

- Previously the ad gets served in real-time - as soon as the page is opened by the end user. For the most part, it's been a "futures" or "reserved" world to-date where buyers of online display ad media bid on publisher placements in the future.
- And, the advertiser must blindly trust, for example, that certain targeting parameters for any buy are implemented correctly by the selling publisher or ad network.
- What RTB will enable with ad networks and exchanges is:
  - The purchase of individual impressions using the "buy" side's data to analyze the impression and bid accordingly in real-time.
  - The optimization of real-time bidding using real-time conversion data.

Ad Exchanges: a new SD Marketplace

- The ad exchange is a real time marketplace with an auction-based system where the participants - advertisers and publishers - transact on a common platform to purchase and sell online graphical advertising.
- Currently, publishers place remnant inventory on the exchange for advertisers to purchase through bidding on a user-friendly interface.
- Ad Exchanges do not compete with ad networks, targeting technologies, or publishers, but rather serve as a more efficient way for the exchange of inventory within these groups.
- Gogole acquired DoubleClick, Yahoo acquired RightMedia, etc. $11 in M&A in 2007

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Why Ad Exchanges?

- No discrimination (everyone can play almost)
  - Elimination of intermediaries and their margins
  - Interests of smaller niche players safeguarded as existing relationships and budget sizes exert no influence and each bidder has equal access to the media
- More efficient
  - Transparent and dynamic pricing landscape due to open bidding process
  - Reduced operational friction due to improved clarity of placement of ad serving on a website
  - Enhanced efficiency due to simplification and standardization of business processes
- Improved liquidity of ad inventory
- Increased role of technology to automate and provide a common platform

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DSPs Ties it all together

- A DSP needs to be able to connect to many different inventory sources to create a huge pool of inventory of tens of billions of impressions a day.
  - Most likely this involves using RTB or some other solution where the DSP can see the impression without the requirement to buy it.
- The DSP must be able to provide global frequency capping across all the inventory sources
- The DSP should provide unified optimization, analytics, reporting and impression attribution. This is one of the most valuable pieces to a good DSP.
- The DSP should enable its users to leverage 1st, 2nd and 3rd party data across the entire pool of impressions.
  - This means that clients should be able to map their user data, work with the DSP's data and buy third party data. This data should be usable in highly complex multivariate targeting routines.
DSPs Ties it all together

- A DSP should be completely transparent in all aspects of the media and data buying process.
- There should be an interface that enables the buyer to manage all of their campaigns and transparently see costs, data, sites, conversions and impression attribution.
- The DSP should have cookie mapping and data sharing systems in place to enable integrations with third party data suppliers, agency data, analytics companies and client data. This process should be possible both on and off line.
- There should be no conflicts that would cause the DSP to do anything not in the best interests of its clients. This includes data, publishers, partners and exchanges.

DSPs Provides Analytics and Decisioning

- DSPs generally calculate the value of each impression in real-time individually relative to the various characteristics of the impression.
- This process enables efficient and effective media buying.

Demand-Side Platform: A trading desk for Adv.

- DSPs: Empowering advertisers thru connect the data dots and buy audiences

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Social Advertising: A new Generation?

- Advertisers still in broadcast mode
- YoY: Double digit growth
• End of Lecture