Introduction
Advertisers are people with something to sell. They want to find an audience who will buy their products. The audience template is something they will draw up that encapsulates some information about who they think this is. This template will contain things like:
- Socio-economic grouping
- Income, personal finances
- Family status
- Home ownership
- Past purchasing behaviour
'Audience' is what advertisers refer to people as
This includes everyone online
- Sites are the websites the audience visits
- When a user clicks on a site this is called a page impression
- Banners are the parts of the page available to serve an add to
- Each page may have multiple banners so the impression is, in effect, sold multiple times
- These are not standardised but larger ones and ones in better positions are typically worth more
1. \( F(\text{Audience, Site}) = \text{Audience Template} \)

2. Algorithmic Implementation

The adserving industry can then be summarised as a series of systems aimed at providing a functional mapping for an audience template onto an audience-site pair.

There are 2 key problems:

1. \( 1 = \text{being able to provide the mapping that satisfies the template} \)
2. \( 2 = \text{being able to be action several mappings efficiently over time} \)
Important Notes

- Advertising spend for a given audience template is agreed in advance
- Metrics for return on this investment are unreliable
- These include
  - Click through rates
  - Cost for acquisition of a new customer
- As spending is essentially fixed sites compete to satisfy the audience template by acquiring greater amounts of information on their audience
Advertising Industry

- Online advertising spend in 2009-10 was $27bn
- Search advertising is 65% of all online advertising spend
- Google has 90% of all search advertising
Google works by indexing the sites.

Then providing an integration to the advertiser – via Google AdWords.

This allows them to purchase against their audience template by considering which keyword searches map best to their template.

They then leverage their massive platform capabilities to action many such mappings at once.
Sample Google Adwords
Sample Report

- Ad served **2,841,346** times since started in December
- Clicked on **2,185** times – Average click through 0.07%
- Consistent Average 12-17 clicks per day
- Total Cost (to date): £1,421.24 (£10/day capped)
- 22% of all traffic

<table>
<thead>
<tr>
<th>Campaign Name</th>
<th>Impressions</th>
<th>Clicks</th>
<th>Conversion Rate</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>PhD Studentships</td>
<td>2,063,283</td>
<td>1,609</td>
<td>0.08%</td>
<td>Best performing</td>
</tr>
<tr>
<td>Web Science</td>
<td>593,230</td>
<td>218</td>
<td>0.04%</td>
<td>Moderate</td>
</tr>
<tr>
<td>Cybercrime</td>
<td>116,818</td>
<td>26</td>
<td>0.02%</td>
<td>Niche area – but ok results</td>
</tr>
<tr>
<td>Digital Economy</td>
<td>17,474</td>
<td>2</td>
<td>0.01%</td>
<td>Not performing (stopped)</td>
</tr>
<tr>
<td>Southampton</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
- The Google model is very powerful for advertisers
- They get extra information on the audience and so Google can often provide a better fit for the audience template
- Google also has the infrastructure to serve the ad to its site based on complex contractual agreements with advertisers.

To compete, a range of companies provide services to sites
- Adservers – allow sites to have many outstanding contracts that can be served efficiently over time.
- Demand Side Processors (DSPs) – algorithmically purchase against audience templates on behalf of advertisers
- Third Party Providers (TPPs) – collect user information by cookie-ing large amounts of people or buying in socio-economic data and overlaying it onto the sites audience

- These companies do not all talk to each other, do not use standardised information, do not all talk to every advertiser or site. The situation is a mess.
Purchasing and Serving Ads
(if you’re not Google)
1. The site and advertiser do a direct deal based on the site’s knowledge of their audience.

2. The terms of this deal are stored in the site’s adserving integration.

3. When a user requests a page, a JavaScript tag forwards this information to the adserver.

4. If an appropriate contract exists, then the advertising content associated with this contract is sent back to the site to serve to the user.
1. The advertiser sends the audience template to a demand side provider with a series of metrics they wish to satisfy that indicate campaign success.

2. When a user requests a page, a JavaScript tag forwards this information to the adserver.

3. The adserver forwards this information to the DSPs and request spot bids for the right to serve an ad to the user.

Real Time Bidding
1A. The site and advertiser do a direct deal based on the site's knowledge of their audience.

2. The terms of this deal are stored in the site's ad serving integration.

3. When a user requests a page, a JavaScript tag forwards this information to the ad server.

4A. If the contract exclusively assigns the rights to the impression to an advertiser, then the ad server serves content back to the site.

4B. Mostly the contract will be optional so the user-site information will be forwarded to the DSPs plus a floor price, corresponding to the price the site would get servicing an existing contract. The DSP then bids if they can beat this price.

1B. They also send the audience template to their demand side provider(s).
Third Party Information
- As well as the infrastructure sites must compete with Google on the information they can provide to map their audience to the advertisers template.
- When the user presents themselves to the site they announce some limited information about themselves.
- This information is augmented by mapping it to other datasets companies provide as audience augmentation services.
- Websites may also hold user data that they leverage in contract negotiations.
1A. The site and advertiser do a direct deal based on the site's knowledge of their audience.

2. The terms of this deal are stored in the site's ad serving integration.

3. When a user requests a page, a JavaScript tag forwards this information to the ad server.

4A. If the contract exclusively assigns the rights to the impression to an advertiser, then the ad server serves content back to the site.

4B. Mostly the contract will be optional so the user-site information will be forwarded onto the DSPs plus a floor price, corresponding to the price the site would get servicing an existing contract. The DSP then bids if they can beat this price.

1B. They also send the audience template to their demand side provider(s).
Browser Cookies

What is a cookie?
Information that a site saves to your web browser
Record your browsing activities
Pages and content you looked at
When you visited
What you searched
You clicked on an ad
Cookies & HTTP

GET /index.html HTTP/1.1
Host: www.example.org

HTTP/1.0 200 OK
Content-type: text/html
Set-Cookie: name=value
Set-Cookie: name2=value2; Expires=Wed, 09 Jun 2021 10:18:14 GMT

(content of page)

GET /spec.html HTTP/1.1
Host: www.example.org
Cookie: name=value; name2=value2
Accept: */*

---

Browser

Server

Browser

Server

---

Collusion for Chrome

This site is informed when you visit the following sites:
- engadget.com
- engadget.com

Reset the graph
Hide inactive sites
Hide the window
Hide the tracing counter
Show the instructions

Privacy: This plugin informs you about the sites you go to that track how they're used. It's a privacy-enhancing tool for your browser and can be enabled anytime by visiting the link or setting your browser.
First Party vs Third Party Cookies

First party cookies
Place by a site when you visit it
Make your experience on the web more efficient
For example:
- Items in your shopping cart
- Log-in name
- Preference
- Game scores
- Sessions

Third party cookies
Place by someone other than the site you are on
Include an advertising network or a company that helps deliver the ads you see
Deliver ads tailored to your interests
Transient vs. Persistent Cookies

Transient Cookies

Jobs is to help “sessionize” your experience on a website “set” when we visit the site, it disappears when we leave

Persistent Cookies

Set the first time we visit the website
It will remain there for the duration that the website determines
Example

Analytics cookies are typically 18 months
Other can be 18 months to 18 years

Help identify a unique browser to our website, closest thing to tracking a “person”/”unique visitor”

Contain not always a Personally Identifiable Information (PII) data.

Random string of numbers or alphabets that only the company who set the cookie can read.
Cookie Tracking

1. Consumer requests Web page from ad network member site
2. Merchant server connects to DoubleClick ad server
3. Ad server reads cookie; checks database for profile
4. Ad server selects and serves an appropriate banner ad based on profile
5. DoubleClick follows consumer from site to site through use of tracking files

Network Member Firms

User Profile Database
Conclusions

• Client server Web is private two-party communication
  • But adverts are from a third party, on behalf of a fourth party, mediated by a fifth party
• Google try to occupy the whole service space themselves
• Everyone else has to piece it together with different specialist services (market ecology)
  • Buying and selling adverts, making contracts, gaining more intelligence about the viewers
  • NSA-style snooping to gain knowledge for the market to increase the value of transactions. Cookies!