Paid Search
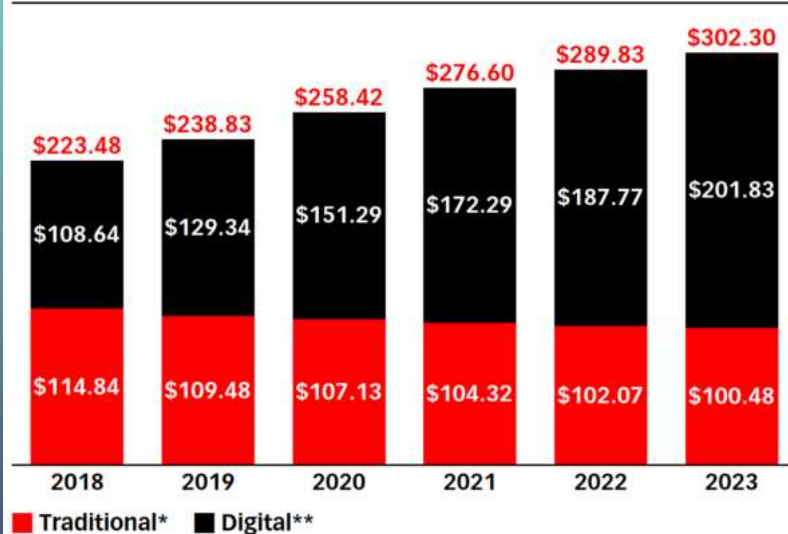
Paying search engines to get traffic

The Growth of Online Ad

Total Media Ad Spending in the US, Traditional vs. Digital, 2018-2023
billions

Year	Total	Digital**	Traditional*
2018	$223.48	$108.64	$114.84
2019	$238.83	$129.34	$109.48
2020	$258.42	$151.29	$107.13
2021	$276.60	$172.29	$104.32
2022	$289.83	$187.77	$102.07
2023	$302.30	$201.83	$100.48

■ Traditional*   ■ Digital**

Note: *includes directories, magazines, newspapers, out-of-home, radio and TV; **includes advertising that appears on desktop and laptop computers as well as mobile phones, tablets and other internet-connected devices, and includes all the various formats of advertising on those platforms; includes SMS, MMS and P2P messaging-based advertising
Source: eMarketer, February 2019

Paid Search is about 40% of Online AD

Digital Ad Spending in the US, by Format, 2019-2023
billions

	2019	2020	2021	2022	2023
Display	$70.06	$81.38	$92.53	$100.71	$107.91
—Video	$36.01	$42.58	$49.02	$53.99	$58.39
—Banners and other*	$25.94	$30.20	$34.23	$37.12	$39.70
—Rich media	$5.28	$5.44	$5.85	$6.00	$6.10
—Sponsorships	$2.84	$3.16	$3.44	$3.60	$3.72
Search	$53.73	$63.90	$73.31	$80.43	$87.15
Lead generation	$2.59	$2.84	$3.05	$3.15	$3.24
Classifieds and directories	$2.19	$2.34	$2.49	$2.53	$2.56
Email	$0.49	$0.55	$0.61	$0.65	$0.68
Mobile messaging	$0.28	$0.28	$0.29	$0.29	$0.29
Total	$129.34	$151.29	$172.29	$187.77	$201.83

*Note: includes advertising that appears on desktop and laptop computers as well as mobile phones, tablets and other internet-connected devices on all formats mentioned; *includes ads such as Facebook's News Feed Ads and Twitter's Promoted Tweets*
Source: eMarketer, February 2019

T10056

www.eMarketer.com

Paid Search Advertising

Paid search

Organic search

Organic Search (SEO)

Less direct control over ranking

Limited control over message
- Message is typically generic / brand driven
- Pulled from code on website

When done well, it can be a very effective method of increasing traffic and leads

High organic rankings have a positive effect on the brand (and vice-versa) 69% of total search clicks are organic

Can be expensive (if outsourced) & time consuming; Not quick process and/or results

Paid Search (PPC)

Can directly influence ranking (based on bid)

Control over message
- Can be more product focused / benefit driven, frequent update

Compensates for inconsistencies in SEO, ensuring consistent placement

High paid rankings have a positive effect on the brand (and vice-versa)

Budgeting opportunity
Immediate results

Example Advertiser

office gift baskets

All · Shopping · Images · News · Maps · More · Settings · Tools

About 284,000,000 results (0.93 seconds)

Corporate Gifting Made Easy | Crowd-Pleasing Desserts
Ad · www.davidscookies.com/ ▾ · (800) 500-2800
Custom Logo Stickers & Cards. Choose A Gift & Customization Options. We'll Do the Rest. In a Rush? Provide A Recipient List & We'll Handle Shipping. Arrives in 2 Days or Less.

Cookie of the Month Club
Large Variety of Fresh, Homemade Cookies Delivered to You Monthly.

Cookie Gift Baskets
Unique Collection of Our Delicious Cookies Starting at Only $39.35!

Olive & Cocoa | Office Gift Baskets | Custom Logo Branding
Ad · www.oliveandcocoa.com/ ▾ · (800) 538-5404
Our Gifts Are Gracefully Packaged Inside Handcrafted Wood Boxes.

Godiva® Corporate Gift Baskets | Chocolates For Self Or Gift
Ad · www.godiva.com/Chocolate_Gifts ▾ · (800) 946-3482
Godiva Corporate Gift Baskets Are The Best Gift Option For Any Office. Order Today! Godiva...

Williams Sonoma® Gift Baskets | Free Shipping On Orders $49+
Ad · www.williams-sonoma.com/Gift-Baskets ▾
Shop Premium Gift Baskets For All Occasions. Exclusively at Williams Sonoma®.

How did we end up in position #1?

How much did we pay for this?

Are we paying more than the ad in slot #2?

Paid search ads are sold by auction

Google runs an auction for every search on real time.

Advertisers only pay when a user clicks (not for display ads!)
Paid search auctions are based on a "Generalized Second Price"
auction.

Because you pay the next highest, or the second highest bid - get it?

Second-Price Auction

Suppose that we have three bidders for the keyword "office gift basket", A, B and C.

A bids $4, B bids $5, C bids $3.

B wins the auction because her bid is the highest ($5>$4 and $3).

However, B only pays Google $4 (the second highest bid, $5 is the first highest, $4 is the second highest, $3 is the third highest bid).

Why not First-Price Auctions?

In first prize auction, people pay the prize they bid.

Advertiser	Bid	Position	CPC
D	$1.00	1	$1.00
B	$0.75	2	$0.75
A	$0.50	3	$0.50
C	$0.40	4	$0.40

Why not First-Price Auctions?

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A	$0.50	3	$0.50
C	$0.40	4	$0.40

In this example, D wins the bid and pays $1 (CPC means "cost per click").
   Advertiser games the system.
   Will D have incentives to decrease bid? How about bidding $0.76?

Second Price Auction

Winner pays CPC = next highest bid

Advertiser	Bid	Position	CPC
D	$1.00	1	$0.75
B	$0.75	2	$0.50
A	$0.50	3	$0.40
C	$0.40	4	$0

In this example, D already pays $0.75, and she has no incentive to decrease her bid. If she decreases the bid to any number greater than $0.75, she still pays $0.75. If she bids <0.75, she will lose the auction.

Second Price Auction

The designer of second-price auction, William Vickrey, won the Nobel Prize in Economics in 1996.

Let's guess

What is the most expensive keyword in Google's search advertising?

Let's guess

What is the most expensive keyword in Google's search advertising?

It is *insurance*.

Let's guess

What is the most expensive keyword in Google's search advertising?

It is *insurance*.

How much do you need to pay Google to get a click on "insurance"?
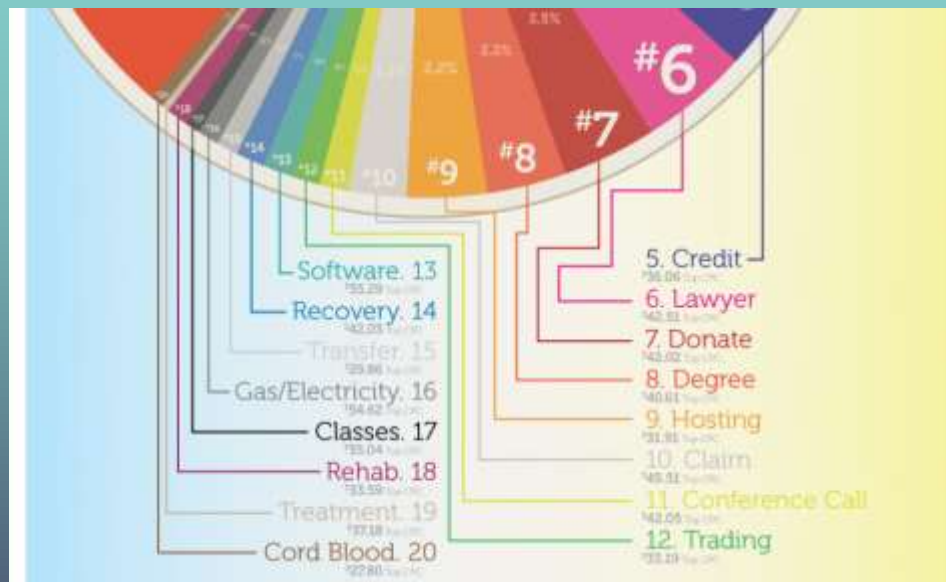
Let's guess

What is the most expensive keyword in Google's search advertising?

It is *insurance.*

How much do you need to pay Google to get a click on "insurance"?

It is *$54.91.*

TOP 20 Keyword Categories
Percentages correspond to the number of keywords in the top 10,000 keywords that belong to that category.

#1 Insurance — $54.91 Top CPC — 24%
#2 Loans — $44.28 Top CPC — 12.8%
#3 Mortgage — $47.12 Top CPC — 9%
#4 Attorney — $47.07 — 3.6%
#5 — 3.2%
#6 — 3%
#7 — 2.8%

5. Credit — $56.06 Top CPC
6. Lawyer — $42.51 Top CPC
7. Donate — $42.02 Top CPC
8. Degree — $40.61 Top CPC
9. Hosting — $31.91 Top CPC
10. Claim — $45.51 Top CPC
11. Conference Call — $42.05 Top CPC
12. Trading — $33.19 Top CPC
13. Software — $35.29 Top CPC
14. Recovery — $42.03 Top CPC
15. Transfer — $29.86 Top CPC
16. Gas/Electricity — $54.62 Top CPC
17. Classes — $35.04 Top CPC
18. Rehab — $33.59 Top CPC
19. Treatment — $37.18 Top CPC
20. Cord Blood — $27.80 Top CPC

Quality Matters!

Quality score affects eligibility to compete in auction, likelihood of winning auction, and the actual amount paid per click. Three main dimensions to improve Quality Score:

Click-through rate
   Identify keywords with low Quality Score, and may be worthwhile pausing or deleting them
   Low scores bring down the overall ad group quality

Ad Relevancy
   Make keyword matches more restrictive
   Build negative keyword list to filter irrelevant search queries

Landing page
   Why does Google care about the landing page quality?

Quality Matters!

Generalized second–price auction with quality score

Currently used by Google and Bing
Position determined by ad rank = bids x quality score
CPC = the next guy's ad rank / own quality score + a bid increment

Advertiser	Bid	Quality Score	Ad Rank	Position	Actual CPC
A	$0.50	10	5.0	1	4.5/10 +.01 = $.46
B	$0.75	6	4.5	2	3.2/6 +.01 = $.54
C	$0.40	8	3.2	3	2.0/8 +.01 = $.26
D	$1.00	2	2.0	4	0/2 + .01= $.01

Why Auctions?

Why a "generalized second price (GSP) auction weighted by quality"?

Auctions are efficient in that they extract more revenue from higher value words

They allow price discrimination without the auctioneer (Google) needing to determine willingness to pay

Auctions are scalable, across words and time

If a word suddenly becomes valuable, the auction can pick that up

Exercise

Example: You won the AdWords auction. Your keyword (e.g., organic pet food) has a max CPC bid of $0.75 and a Quality Score of 9. The advertiser in second place has an Ad Rank of 6.3. Suppose an expert has offered to improve your website so that your Quality Score goes up to 10. Suppose the number of clicks will be 1,000. How much are you willing to pay the expert?

Exercise

Example: You won the AdWords auction. Your keyword (e.g., organic pet food) has a max CPC bid of $0.75 and a Quality Score of 9. The advertiser in second place has an Ad Rank of 6.3. Suppose an expert has offered to improve your website so that your Quality Score goes up to 10. Suppose the number of clicks will be 1,000. How much are you willing to pay the expert?

Initial CPC: 6.3/9 + 0.01 = 0.71

Improved CPC: 6.3/10 + 0.01 = 0.64

So, you save 0.71 – 0.64 = 0.07 on each click. Because you have 1,000 clicks, you will save $70. Therefore, you are willing to pay the expert up to $70.

Summary

Search engine runs an auction for every search.

Advertisers only pay when a user clicks (pay-per-click).

Paid search auctions are based on a "Generalized Second-Price" auction, because you pay the next highest bid
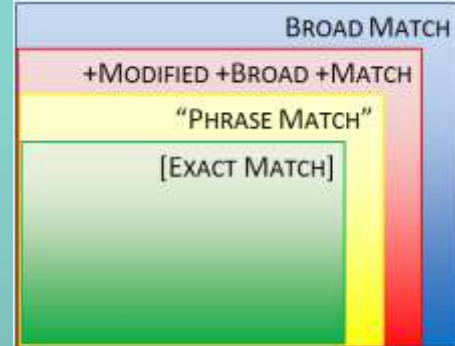
Many refinements such as "quality score".

Keywords

Long Tail of Keywords

Most Search Queries Are Unique: you have to bid on lots of keywords
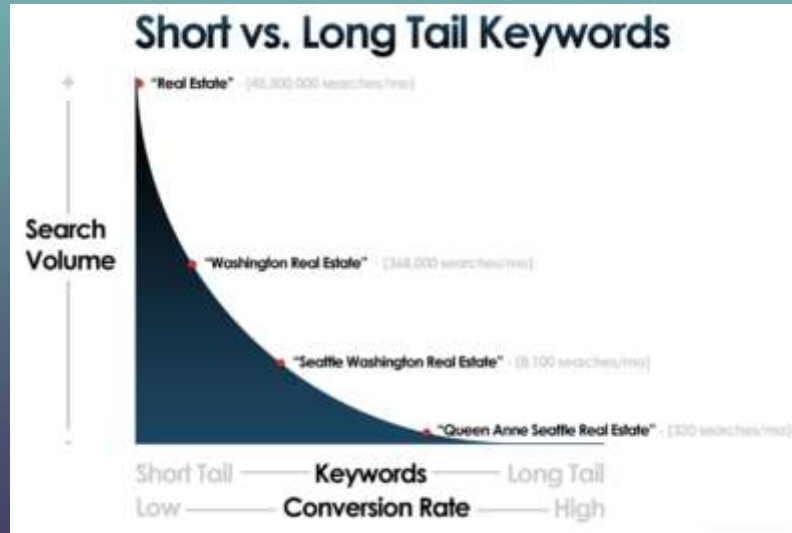
Five Types of Keyword Matches

Match type	Special symbol	Example keyword	Ads may show on searches that	Example searches
Broad match	none	women's hats	include misspellings, synonyms, related searches, and other relevant variations	*buy ladies hats*
Broad match modifier	+keyword	+women's +hats	contain the modified term (or close variations, but not synonyms), in any order	*hats for women*
Phrase match	"keyword"	"women's hats"	are a phrase, and close variations of that phrase	*buy women's hats*
Exact match	[keyword]	[women's hats]	are an exact term and close variations of that exact term	*women's hats*
Negative match	-keyword	-women	are searches without the term	*baseball hats*

Broad Match

Default match type.

Display ads if searcher's query matches the keyword exactly, on variations like singular and plural, stemming, misspellings, as well as related words.

For example, custom made shoes can trigger ads on search queries like:
    custom made shoes
    shoes custom-made
    castom made shoes

Broad Match Modifier

Restricts Google's expanded match capabilities

Select some or all of the words in the keyword you'd like to restrict by adding a plus symbol (+) before each selected word

For example, the keyword +University +Hong Kong +jobs can trigger ads on search queries like:
> University of Hong Kong jobs
> University of HK job
> Hong Kong University jobs
> HKU jobs

Phrase Match

Can apply to single-word or multi-word keyword by enclosing it in quotes
For example, keyword "silk curtain" could trigger ads on search queries like:

    silk curtain

    silk curtains

    silky curtain

    want to buy silk curtains

    buy silky curtains for stage

But, keyword "silk curtain" would not trigger ads on search queries like:

    silk for curtain

    curtain silk

    silk kitchen curtain

    silk shade

Exact Match

Most restrictive option
Can be applied to single word or phrase by enclosing it in square brackets
For example, keyword [broadway plays] can trigger ads on search queries like:

     broadway play
     braodway play
     braodway plays

But keyword [broadway plays] would not trigger ads on search queries like:
     broadway plays today
     nyc plays
     play broadway

Negative Keywords

A negative keyword is a single word or a phrase prefaced by a single minus symbol.

For example, there are two places called Washington: Washington DC and the Washington State. You can use – DC to filter queries on Washington DC.
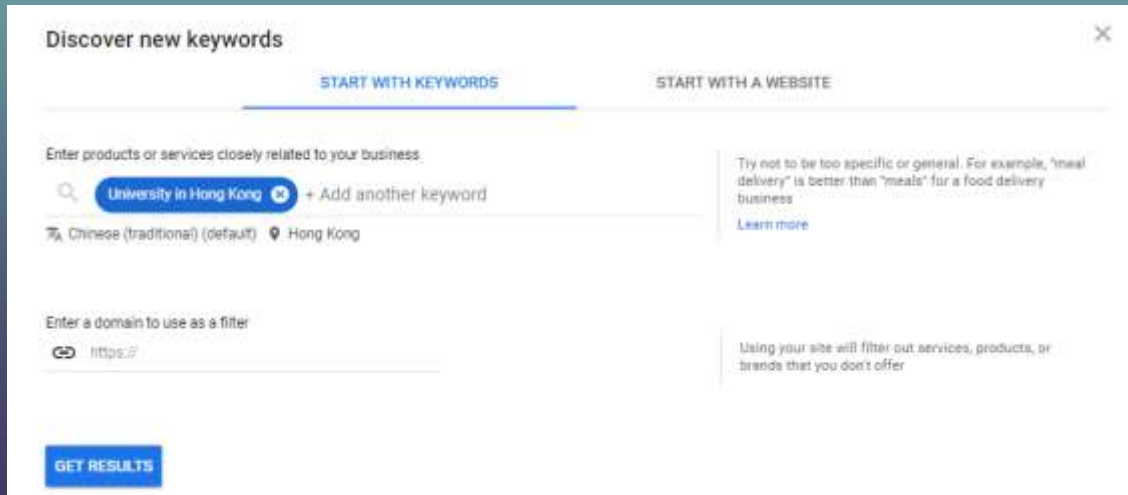
Developing Your Keyword List

Key is to figure out how potential customers are searching for your product
Play with Google's auto-complete feature
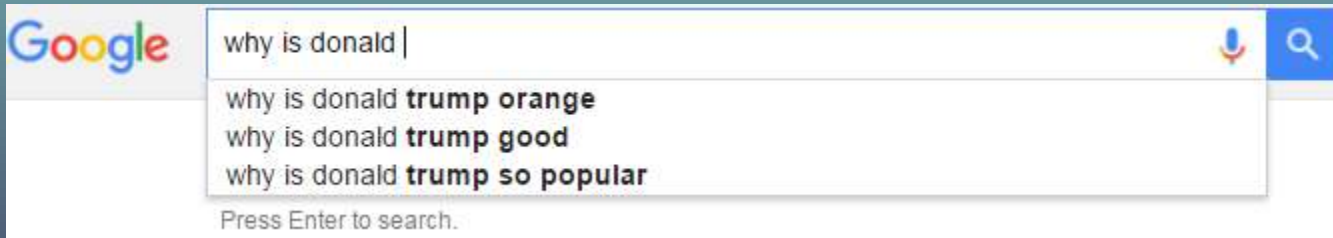
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Play with Google's auto-complete feature

Google's Keyword planner tool

Developing Your Keyword List

Key is to figure out how potential customers are searching for your product
Play with G
Google's K
Analyzing
   Tools: dSpy.com

Top Keywords

Rank	Term	SEO Clicks Per Month
54	finance major reddit	0
40	hk business	0.05
36	execed	0.56
29	www.bm	0.56
9	hong kong university of science and technology	31.1
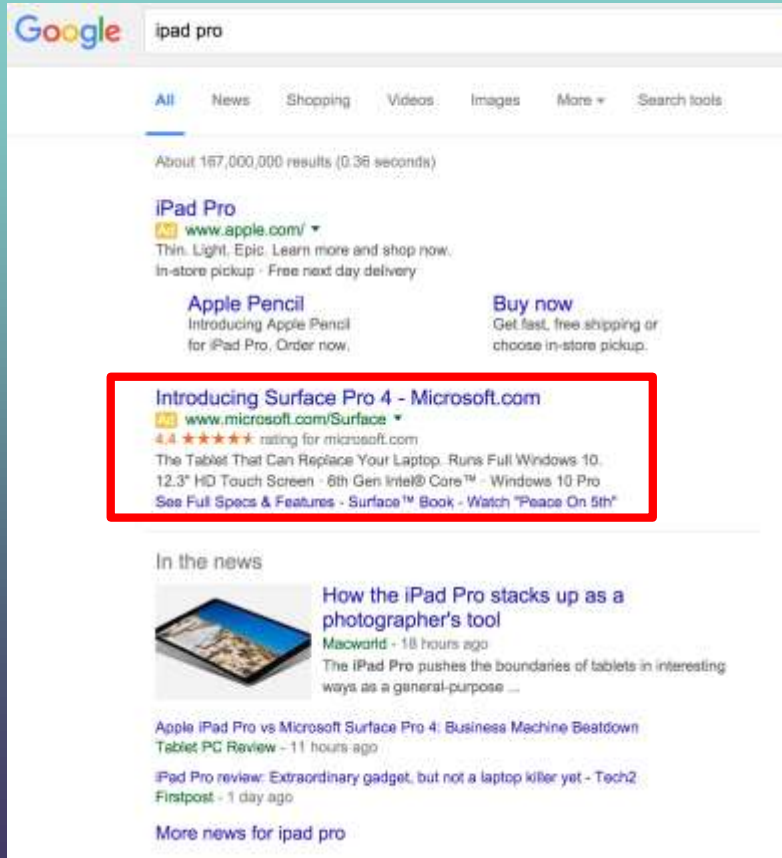
VIEW ALL ORGANIC KEYWORDS >

Analysis of
https://www.bm.ust.hk/

Buy Your Competitor's Keywords

Smaller share brands tend to poach the larger share brands

Targeting Options other than Keywords

Language
Locations: Country, City, or Zip code
Device & browser
Timing: using Ad Schedule & Bid Adjustment

Example

You run a dog-sled touring business in Alaska, and you have an existing ad group max CPC bid of $1.00. You've scheduled your ad to show on Tuesdays between 8 and 11 a.m. You decide to set a bid adjustment of +10% on Tuesdays between 8 and 10 a.m. So, your maximum bid for that time period would be $1.00 x (+10%) = $1.10.

Because many of the customers that love your dog-sled tours live in Anchorage, you decide to set an additional +20% adjustment for Anchorage. Your maximum resulting bid for a search that occurs on Tuesdays at 9:30 a.m. for a customer in Anchorage will be $1.32. Here's how it works:

Starting bid: $1.00
Tuesdays, 8 to 10 a.m. adjustment: $1.00 x (+10%) = $1.10
Anchorage adjustment: $1.10 x (+20%) = $1.32
Maximum bid for Tuesdays, 8 to 10 a.m., in Anchorage: $1.32

Takeaways

Understand the buying process of paid search ads

Different types of keyword match
    Broad, broad modifier, phrase, exact, negative

Keyword tools are commonly used to gain competitive insights

Measurability

"I know half my advertising is wasted,
I just don't know which half"
--- John Wanamaker

How do we measure the effectiveness of online ads?

How do we measure the effects of online ads?

Impressions
    Frequency & Reach
Clicks
    Click-through rate
Ad Engagement
    Mouse-over, Interaction
    FB: Like, Share
    Twitter: RT, Favorite
Conversions
    Sign-ups, Downloads, Place in cart, Purchase

Impression

Impression: A user loads 1 ad on a website
Frequency: Number of ads per person
Reach: Number of people who see at least one ad

Clicks

Instantaneous feedback on individual ads – revolutionary!

Clicks can be used as a measure of intent to buy.

Click-Through Rate (CTR) = the number of times a link was clicked divided by the number of times it was seen. $CTR = Clicks/Impressions$

Correlation between CTR & ad effectiveness (AdFX) is debatable
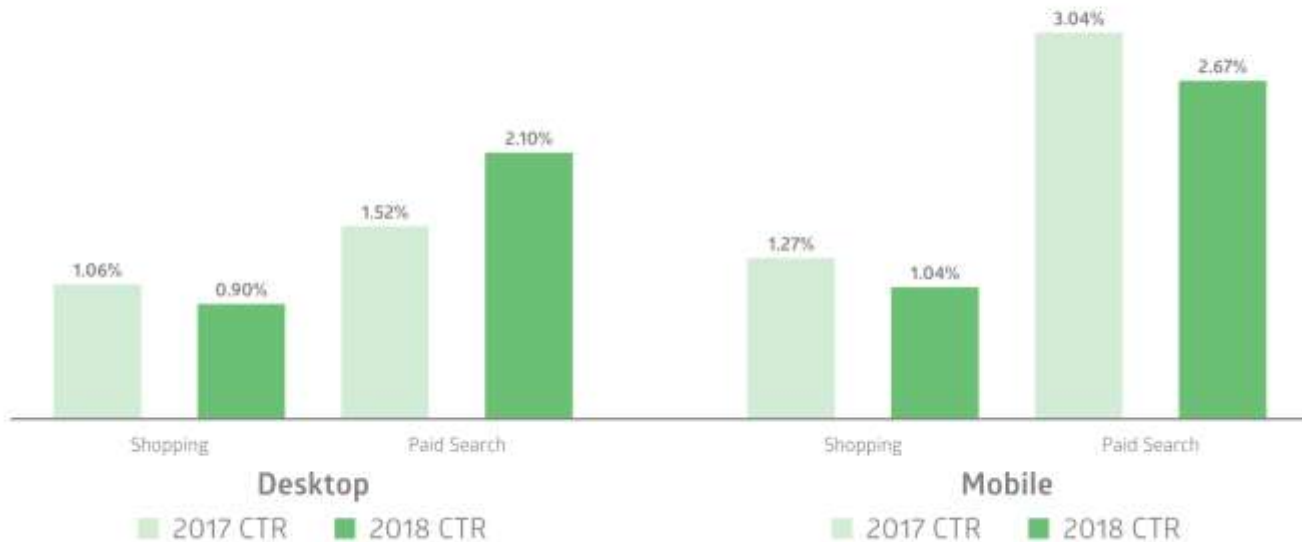
E.g. Does a higher CTR on mobile mean higher mobile AdFX?

Ads are smaller, but fill more of the screen

Up to 50% of clicks on mobile banner ads are accidental (GoldSpot Media)

Clicks

Click-Through Rate in Google Shopping and Google Paid Search
By Device 2017-2018

Desktop — Shopping: 1.06% (2017), 0.90% (2018); Paid Search: 1.52% (2017), 2.10% (2018)

Mobile — Shopping: 1.27% (2017), 1.04% (2018); Paid Search: 3.04% (2017), 2.67% (2018)

2017 CTR   2018 CTR

Source - Sidecar 2019 Benchmarks Report: Google Ads in Retail

Sometimes clicks are unreliable...Firms might even engage in click fraud

Engagement

Engagement: A catch-all for user interactions with the ad beyond clicking including mouse-over, interacting with interactive ads, rollover, start or skip video

Social engagement/conversion include
    FB: Like, Share
    Twitter: RT, Favorite

Intentional measure showing whether consumer likes ad more than just clicks

Engagement

Conversions

Conversions: A catch-all for user interactions with advertiser including sign-ups (newsletter, membership, etc.), downloads, shopping on-site, placing items in cart, purchasing.

Conversion Rate (CR) = the number of conversions divided by the number of times the ad was clicked. $CR = Conversions/Clicks$

Probability of Purchase = CTR x CR, here purchase is broadly defined.
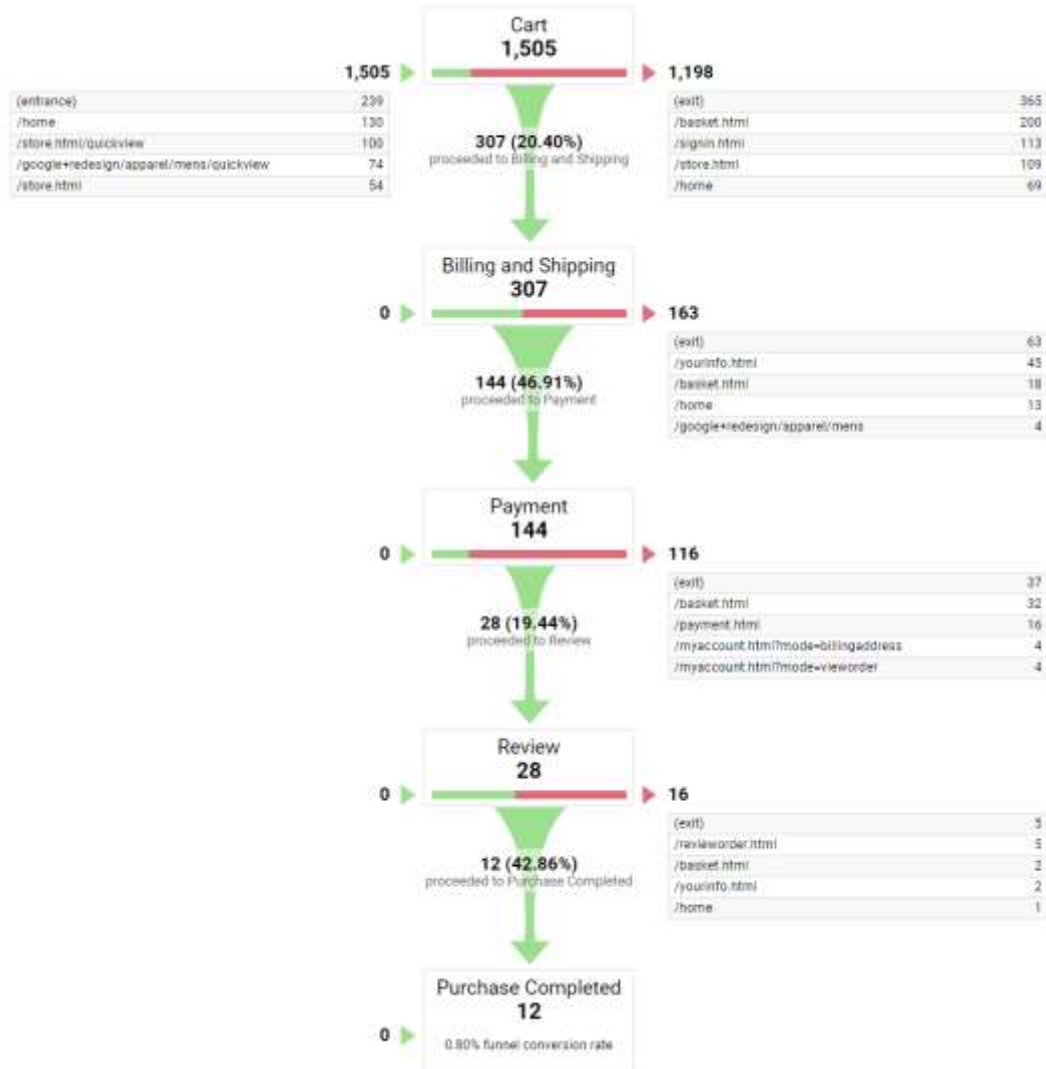
Conversions: Pros and Cons

(+) Some direct response advertisers only need conversion info (like app makers & downloads)

(+) For brand advertisers (like Coca-Cola), conversions (& engagement) are often all they can measure!

(−) Conversion rates are typically very low
Decisions require much more impression data

Some Metrics

Impression = number of instances ad is seen by user

Cost-per-Click (CPC) = cost paid to search engines

Click-Through Rate (CTR) = efficiency of generating clicks from delivered impression

Conversion Rate (CR) = efficiency of generating sales from click

Probability of Purchase = CTR x CR

Revenue = Prob. of purchase x Profit margin per purchase x Impressions

Cost = #Clicks x CPC, where # Clicks = Impression x CTR

Net Revenue = Revenue – Cost

Return on Investment (ROI) = Net Revenue / Cost

Reminder

In next lecture we will be working on the data project.

Please bring your laptop with you (with R/Tableau installed).