



# CSCI 15: AN INTRODUCTION TO THE MODERN INTERNET

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Lecture 10: Social Web (Google and Facebook)

# ADMIN

- Papers are due Friday!!!
  - At midnight
- As I mentioned in the first class: no extensions (my grades are due)
- Make sure to have references with a quality bibliography
- Please don't plagiarize or miss the deadline

# NEWS FROM TODAY



[Business](#) [Markets](#) [World](#) [Politics](#) [TV](#) [More](#)

WORLD NEWS JANUARY 29, 2020 / 7:35 AM / UPDATED 2 HOURS AGO

## Russia blocks encrypted email service ProtonMail

2 MIN READ



MOSCOW (Reuters) - Russia said on Wednesday it had blocked the Swiss email service ProtonMail, popular among journalists and activists for its focus on user privacy and high level of encryption.

Russian communications watchdog Roskomnadzor said ProtonMail, which uses end-to-end encryption to protect user data, had been used to send fake, anonymous bomb threats.

Such threats have frequently led to mass evacuations of public buildings across Russia.

Roskomnadzor said that ProtonMail had refused to provide Russian authorities with information on the owners of email accounts allegedly associated with fake bomb threats.

It said these had been sent via ProtonMail since last year and that incidence had increased this month after a similar service, Smartmail.com, was blocked.

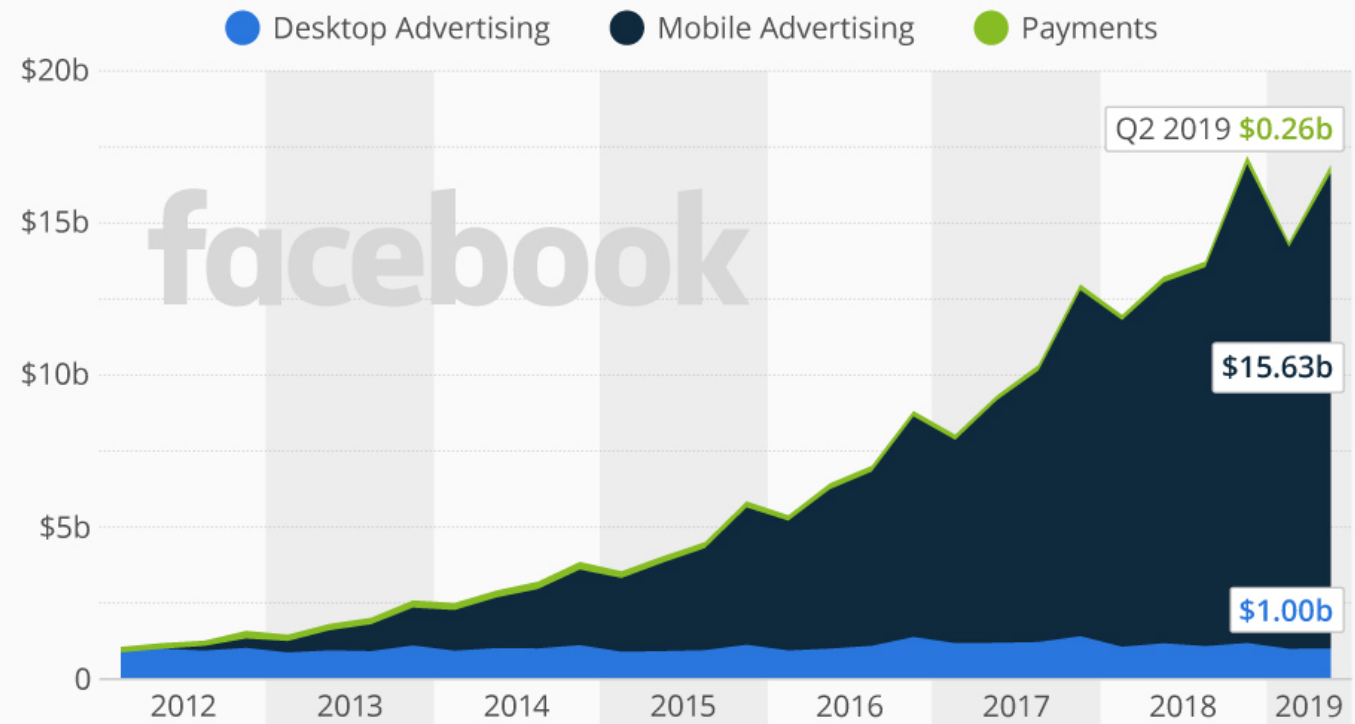
# HOW DOES FACEBOOK MAKE MONEY?



# HOW DOES FACEBOOK MAKE MONEY?

## Facebook's Growth Is Fueled by Mobile Ads

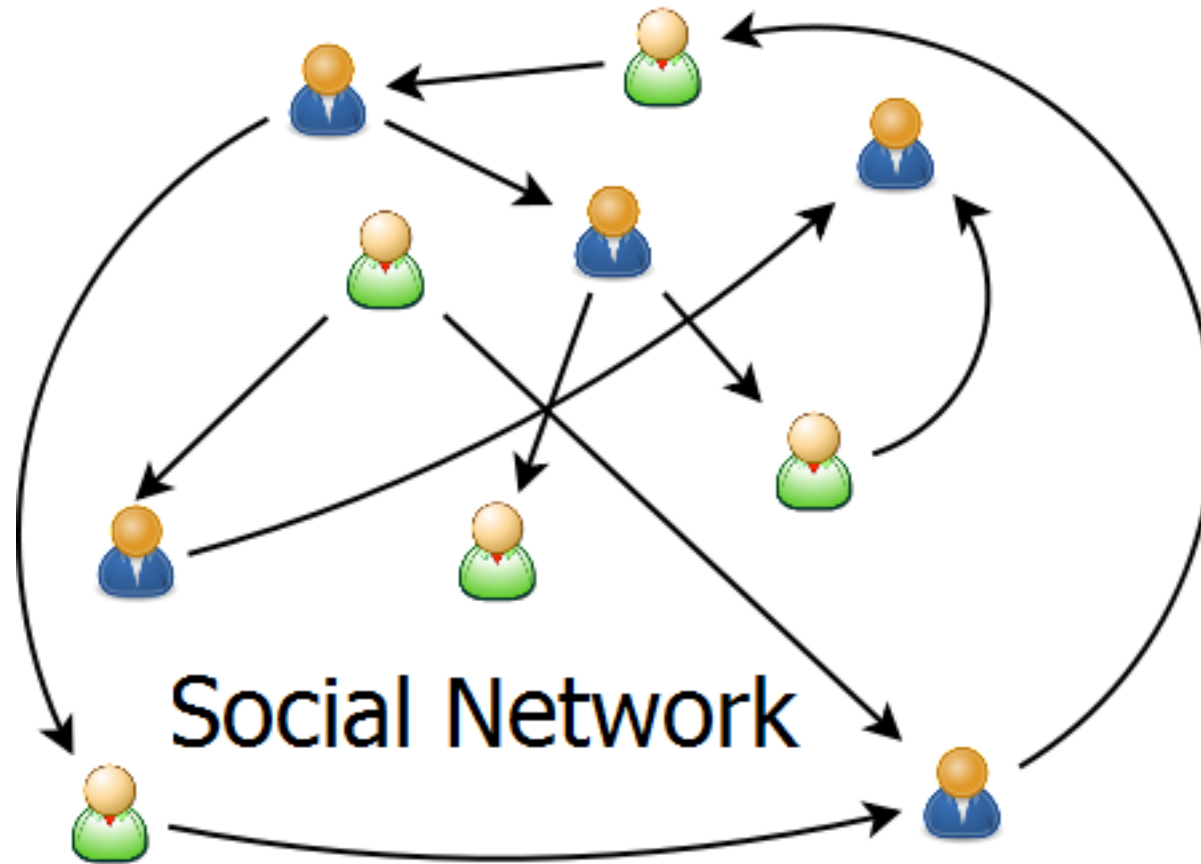
Facebook's quarterly revenue by segment



@StatistaCharts Source: Facebook

statista

# WHAT DOES FACEBOOK HAVE?



# TARGETED ADS

- <https://www.facebook.com/business/ads/ad-targeting>
- [https://www.facebook.com/business/insights/tools/audience-insights?ref=fbb\\_choose\\_audience](https://www.facebook.com/business/insights/tools/audience-insights?ref=fbb_choose_audience)
- <https://www.bbc.com/news/technology-46618582>

# GRAPH SEARCH

- Soon scaled back
- Recently abandoned
- <https://www.youtube.com/watch?v=U94DTrjAvuA>



# GROUP DISCUSSION: 3-4 PEOPLE

- What do you think Facebook sells?
- Is this clear to users?
- Is this OK?
- Do you use Facebook? How?

Google ryanair

Web News Images Maps Videos More Search tools

About 27,300,000 results (0.34 seconds)

**Ryanair: Cheap Flights - Book Now Cheap Flights to Europe**  
**Ad** [www.ryanair.edreams.com/Flights](http://www.ryanair.edreams.com/Flights) ▼  
Fly with Ryanair and Save Money!  
Cheap Flights from €19 · More than 750 Airlines · Flight + Hotel Offers  
Flights from Ireland All the Destinations  
Cheap Flights Offers Flights Cork London

Official Ryanair Website | Cheap Flights | Exclusive Deals  
<https://www.ryanair.com/ie/> ▼  
Book Cheap Flights direct at the official Ryanair website for Europe's lowest fares. Fully allocated seating and much more now available online.

- Also sells ads
- Obvious: search ads

GOOGLE

# GOOGLE ADS

- **Sell service to websites:**
  - 1. Put our ad on your site
  - 2. We'll give you a portion of the profits
- **Limitations:**
  - Can't fill site with ads (must be mostly content)
  - Competitor's names/brands as keywords
  - No adult content
  - Like search results: good site means good ad revenue
- **Owns DoubleClick**

# GOOGLE ADS: WHY?

- Very very very easy!
  - Copy-paste code onto your website
  
- Very effective

# GOOGLE ADS: WHAT IS IT BASED ON?

- Official account: emails, search history, etc.
- Cookies
- Tracking activity across the web
  - You don't always know when you access Google!

## Reasons you might see an ad

- **Your info:**
  - Info in your Google Account, like your age range and gender
  - Your general location
- **Your activity:**
  - Your current search query
  - Previous search activity
  - Your activity while you were signed in to Google
  - Your previous interactions with ads
  - Types of websites you visit
  - Types of mobile app activity on your device
  - Your activity on another device
- **Other info:**
  - The time of day
  - Info you gave to an advertiser, like if you signed up for a newsletter with your email address

Google can personalize ads so they're more useful to you.

Personalized ads aren't shown or hidden from you based on sensitive categories, like race, religion, sexual orientation, or health.

# GOOGLE PRIVACY

- All information stays in Google ecosystem
- (So far as I know) no API into their databases
  - Essentially the weakness of Facebook's approach

# WHO GETS THE AD? FOR HOW MUCH?

- Middle aged person from an affluent area searches “NYC hotels” after searching for NYC flights
- Someone from Williams College ISP searches for “pizza”
- Valuable!
  - How much?
  - Who gets it?



# AUCTIONS

- Google holds an auction for each ad
  - Every time any person views a site
  - Millions of auctions per minute
  
- How is that possible?



# AUCTIONS: LET'S TRY IT

- Sealed bid auction: write a number down that you're willing to pay
- Everyone submits simultaneously
  
- Who wins?
- How much do they pay?

# AUCTIONS

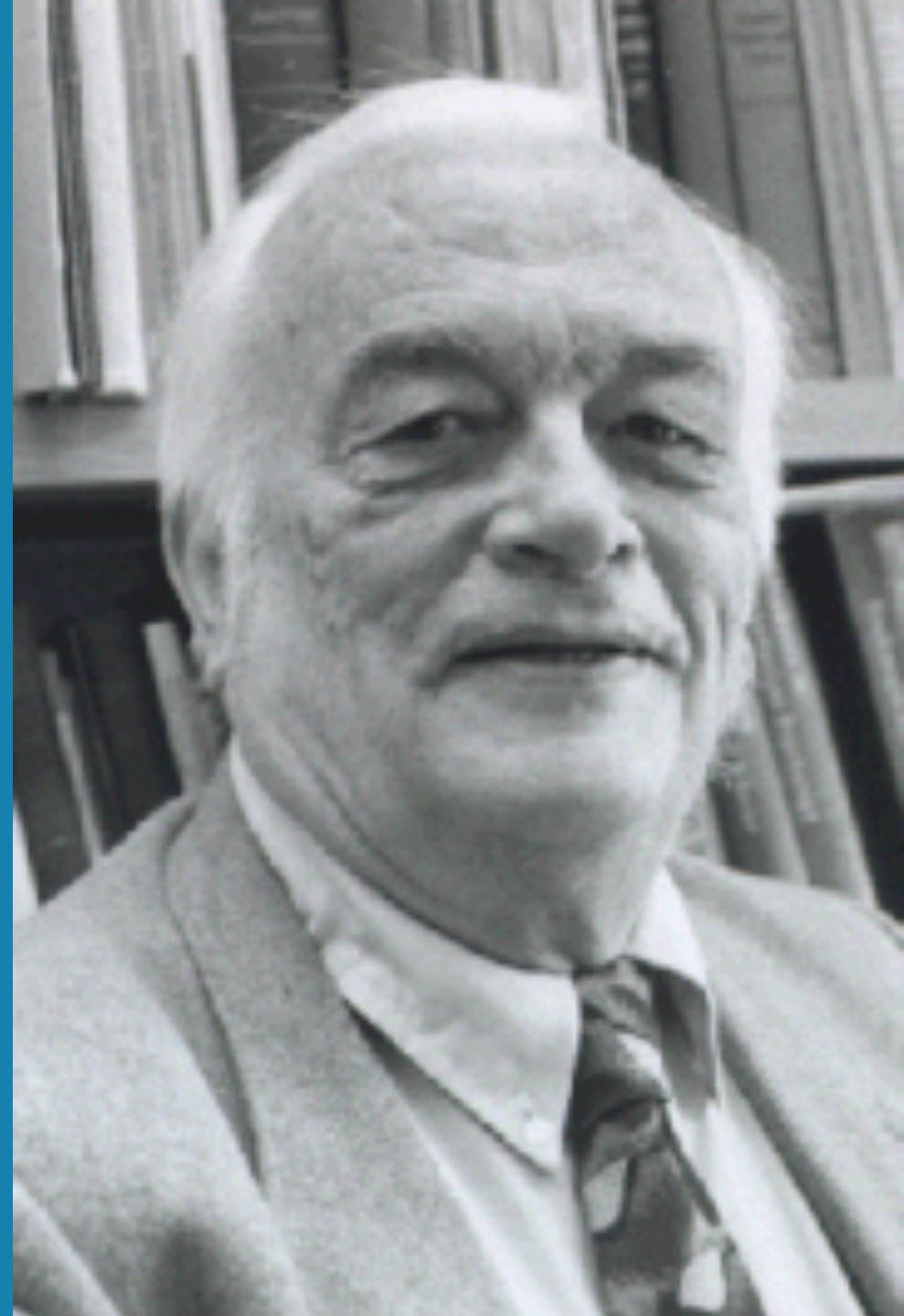
- What do you need to take into account when figuring out your payment?
- Why is this a problem for Google?

# WHO WANTS TO CHANGE THEIR BID?

- Why?

# VICKREY AUCTION

- Highest bid wins
- Pays cost of *second* highest bid
  
- Why?



# TRUTHFUL MECHANISM

- I claim: your best bid is the value you put on the item
  
- Proof!

# HOW DOES GOOGLE WORK?

- Millions of sealed-bid second-price auctions every minute
- Company doesn't need to know anything
  - Can automatically bid based on their own valuation
  - This is always the optimal bid!
- \$40 billion/year