

Advertising systems in social media

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CS 60017
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What are we going to learn

- Social advertising systems
 - Why bother about them?
 - The curious case of Facebook ads
 - How can we leverage these systems for doing good
- Abuse of the advertising systems
 - Why is targeted advertising bad?
 - Privacy risks with PII based targeting

**Why bother about social
advertising?**



Advertising systems







- These systems fuel your favorite websites and services
 - Facebook, Twitter, Google, YouTube ...
- But what is digital advertising?
 - “digital advertising is any form of advertisement that appears online, whether on your web browser, your social media apps, or other destinations and properties across the internet.”

<https://www.swishvideoapp.com/what-is-digital-advertising-a-comprehensive-guide/#>

Advertising systems: Example

twitter ads



 All  Images  News  Videos  Maps  More Settings Tools

About 2,920,000,000 results (0.65 seconds)

Snapchat Ads | Reach your Audience | Drive Results

Ad

forbusiness.snapchat.com/business ▼

Achieve your business goals with ads that lead to action on Snapchat. Drive results with fullscreen ads tailored to the mobile-first generation. Measure & Optimize.

LinkedIn Sponsored Ads | Grow Your Business | LinkedIn.com

Ad

business.linkedin.com/sponsored-ads ▼

Build Your Brand and Raise Awareness With Targeted Ads on LinkedIn. Promote Content. Types: Website Conversions, Lead Generation, Brand Awareness, Website Visits, Video Views, Engagement, Job Applicants.

[LinkedIn Ad Pricing](#) · [Case Studies](#) · [Conversion Tracking](#) · [Brand Awareness](#) · [Video Views](#)

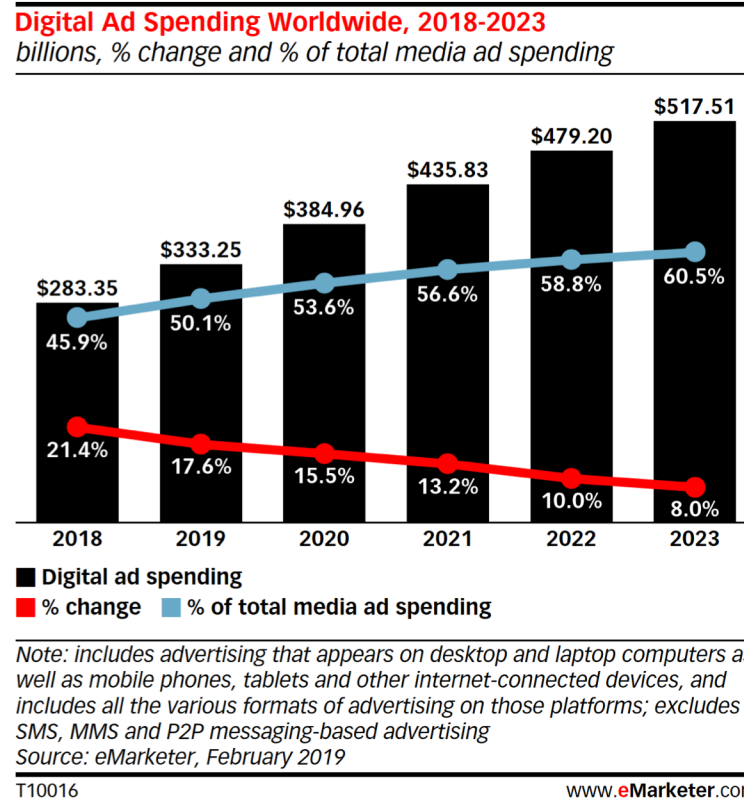
Twitter Ads

<https://ads.twitter.com> ▼

Advertise on Twitter. Solutions to ... Don't have a Twitter account? Sign up ... Learn more about **Twitter Ads** and our advertising policies on our help center →.

How important are advertising systems?

- Very!



What is social advertising?

- Advertising on social platforms
 - Shown during your browsing social platforms
 - Leverage socially shared data to target ads (you shared with your friend that you really like to sing)
 - Shows social interactions to influence you

Shown in social platform: Facebook

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Facebook © 2019

Social advertising: Example

Social data: I like gadgets

Social data: I like to ask friends where to travel

Social data: My friends donated here

Social interactions: Likes, comments, shares

Sponsored

Create Ad

log

Travel planning made easy

and cable needs! 🤖

- ✓ Type-C to Type-A,
- ✓ Nano Sim Storage
- ✓ Sim Pin
- ✓ LED Light... See More

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Shop Now

getthegarlic.com

UrbzSurvival Multi-function Universal Smart Adaptor Card

Shop Now

2.4K

Travel tips from friends

togalongwith.me

Collect your friends' favorite travel tips all in one place.

The Large Scar On Her Head Tells The Sto...

milaap.org

You can't miss the scar on 12-year-old Janvi's shaven head. It's a constant reminder to he...

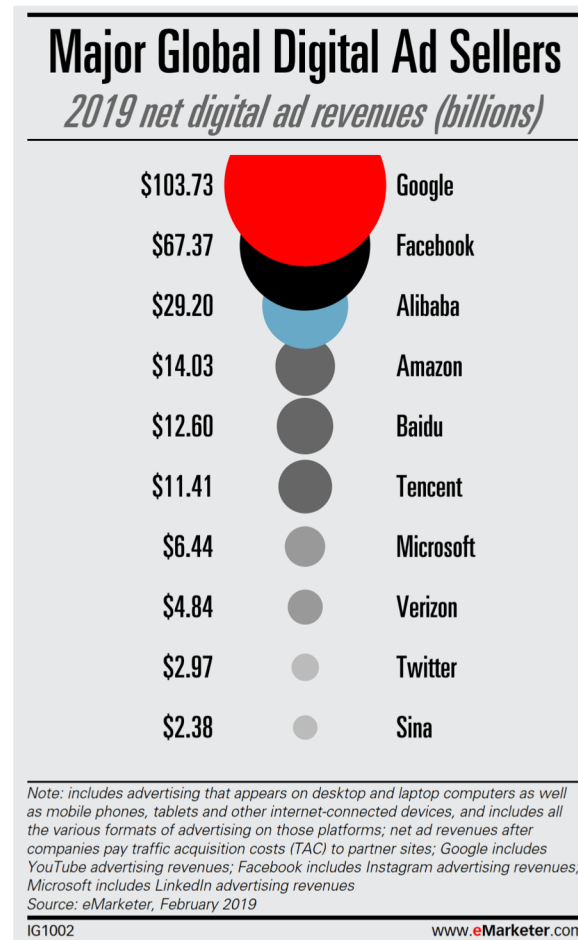
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Facebook © 2019

Is social advertising a big business?

- Yes!



How Facebook ads work?

From a system's point of view how does advertising work?

- An advertiser goes to Facebook.com ad interface
 - <https://www.facebook.com/advertising>
 - Different from your run-of-the-mill Facebook.com
- She uploads the ad material
 - Picture, video, title, headlines, embedded link etc.
- She targets the audience
 - Only IIT Kharagpur students, who are male, 18-24 yrs. old
- Finally Facebook shows the ad and bill her
 - Facebook also gives her stats on who has seen the ad
 - She pays Facebook

Let's look under the hood

- Let's try to float an ad
 - <https://www.facebook.com/business/>
- Check out the super detailed targeting parameters
 - Also Facebook just binned the normal users in quite detailed way and shows ads to interested users
 - How?
 - Principles of inferring interest and recommender systems

**Leveraging social advertising
platform data**

What data can you get from advertising platforms?

- You can divide the population by
 - Location
 - Age
 - Gender
 - Interests ...
- You will get the population count for each of the divisions
- Question: How can you leverage the data?

You can use this data to understand demographics of any sub-population

- Check out:
 - <https://fb-doha.qcri.org/>
- Let's look into how you can compute “cultural assimilation” of a population
 - Paper: Rock, Rap, or Reggaeton?: Assessing Mexican Immigrants' Cultural Assimilation Using Facebook Data, WWW'19
 - <https://ingmarweber.de/wp-content/uploads/2019/05/Rock-Rap-or-Reggaeton-Assessing-Mexican-Immigrants-Cultural-Assimilation-Using-Facebook-Data.pdf>

Finding Cultural assimilation

- Key Question:
 - To what degree Mexican immigrants in the U.S. are assimilating culturally?
- Proxy of cultural assimilation: Musical taste of second generation Mexicans
 - Used musical interest categories of population
 - Challenge: How to know they are second generation?

Data collection

- Collected Facebook data across the following demographics
 - gender, age, home location, ethnic affinity, and interests.
- How to detect second generation?
 - Find Hispanic American non-expats with interest in Mexico -
 - “Mexican Americans (Mexico)”
 - Find Hispanic Spanish-speaking American non-expats --
 - “Mexican Americans (Spanish)”
 - Find Hispanic Americans non-expat located in cities with a high concentration of Mexican-Americans -- Mexican Americans (communities)

Is this data representative?

- Yes!

Population name	Facebook estimate	Population estimate
Anglos	112,000,000 (59%)	189,591,066
African Americans	29,000,000 (78%)	37,014,326
U.S. Hispanics	14,000,000 (57%)	24,695,129
Mexican-Americans (communities)	4,100,000 (18%)	23,407,709
Mexican-Americans (Spanish)	1,700,000 (9%)	19,380,816
Mexican-Americans (Mexico)	2,900,000	n/a
Mexican immigrants	9,400,000 (82%)	11,508,371
Mexicans in Mexico	62,000,000 (56%)	111,375,417

What are the key populations for this study?

- Non-Hispanic white Americans (“Anglos”)
- African Americans
- Mexican immigrants to the United States
- Mexican-Americans
- Mexican people living in Mexico

How to compute musical interests of a population?

- The also divided each population with music genres
 - Total 741 music genre
 - Rock, pop, jazz, hip-hop etc.
 - Compute interest ratio: fraction of a population p interested in music genre I

$$I_{p,i} = \frac{\text{count}(p, i)}{\sum_{i' \in I} \text{count}(p, i')}$$

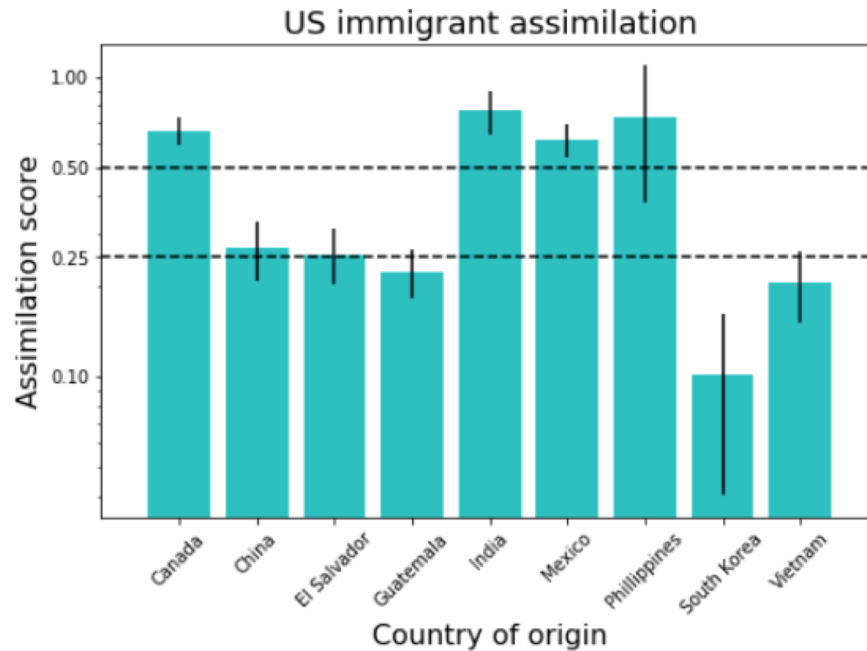
- Question: if 10 users from population p show interest in hip-hop music, 60 in rock music and 30 in rap music, what is the interest ratio for rap?

Finally: How to quantify assimilation?

- For each genre the compute the assimilation ratio (AR)
 - Ratio of ex-pat interest proportion and destination interest proportion
 - Higher AR, the expats looks similar to the destination population

$$AR_i = \frac{I_{\text{expat},i}}{I_{\text{dest},i}}$$

Which community in US are most assimilated?



- India and Philippines are most assimilated!

There are more applications

- Check <https://www.slideshare.net/IngmarWeber/presentations>
 - Using advertising data to model migration, poverty and digital gender gaps
 - Correlated Impulses: Using Facebook Interests to Improve Predictions of Crime Rates in Urban Areas
 - Digital advertising data for migration research

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