

Price Trade-offs in Social Media Advertising

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Social Media Advertising

Microblog Platforms

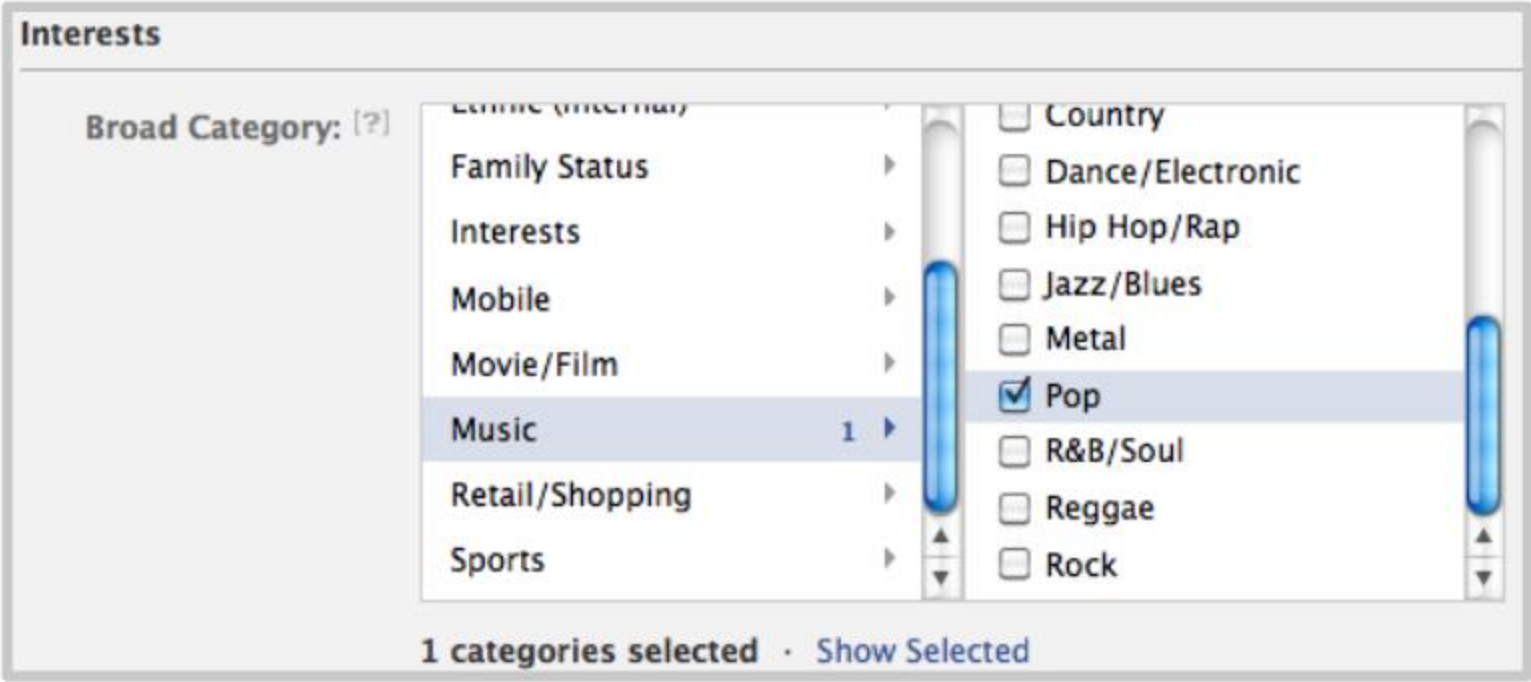


yammer[≡]

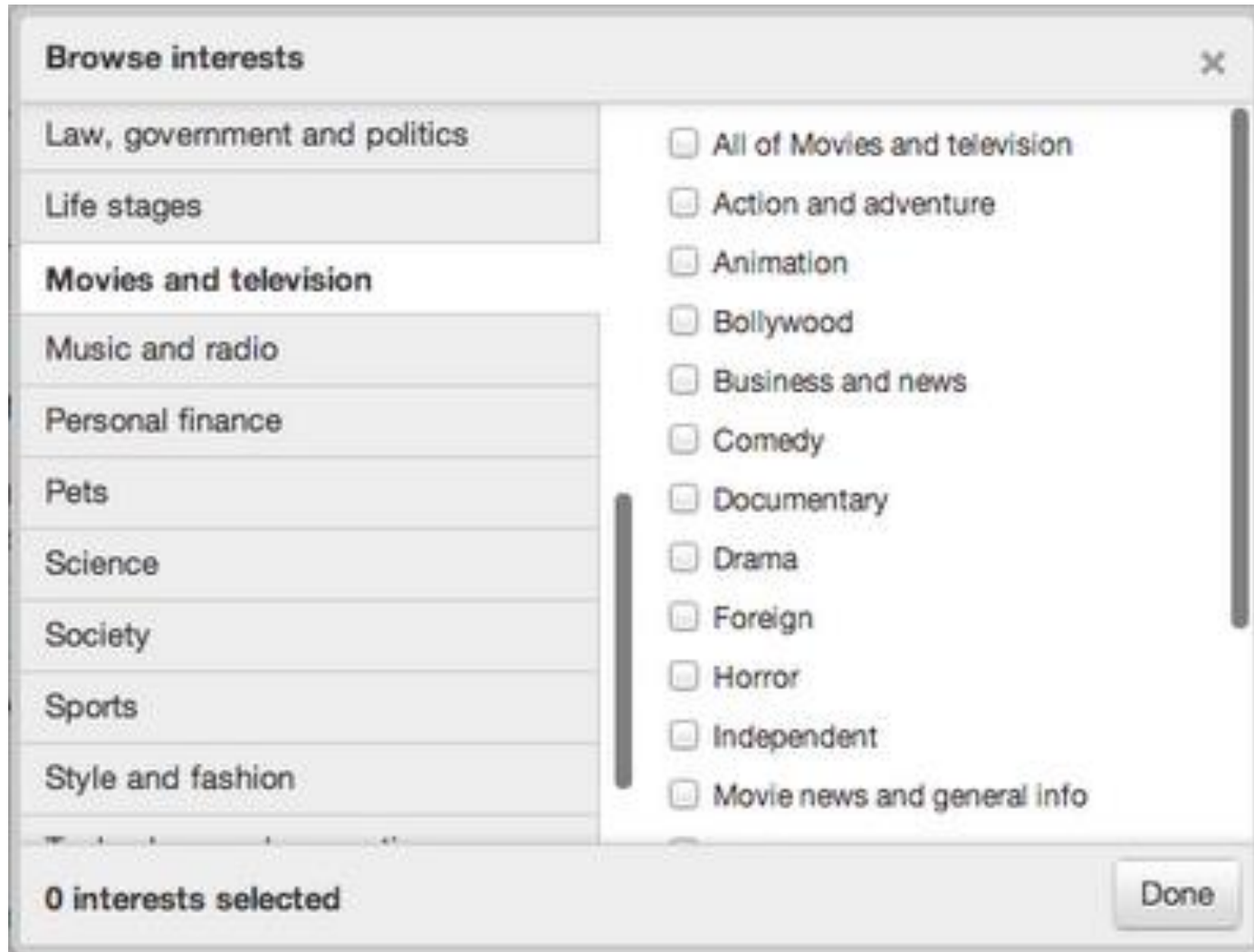
tumblr.

Instagram

Topic Based Advertising - Facebook



Topic Based Advertising - Twitter



Promoted Content

Facebook Promoted Post

 **William Andrew Raposo**
Bespin City Nights returns tonight to The Wythe!
 **Midnight Magic**
Tonight, Morgan and Andrew play jams at The Ides (atop The Wythe Hotel in Brooklyn) from eight o'clock on to the cocktail and Instagramming set.
Like · Comment · Share · 11 minutes ago · 

 **The Blacklist** Suggested Post Like Page
WATCH James Spader in fall's hottest new drama. #TheBlacklist premieres tonight at 10/9c.
 **The Blacklist - Tonight at 10/9c on NBC.**
Length: 1:00
Like · Comment · Share ·  2,843  330  565 Sponsored

 **Sean Kilpatrick** was tagged in Nick Kelly's photo.


Twitter Promoted Post

 **Stephen Forster** @fozeeee 44m
32 Website Optimization Terms Every Marketer Should Know [Glossary] blog.hubspot.com/website-optimi... via @hubspot
 Retweeted by Kelly Steinbach
 View summary

 **HootSuite** @hootsuite 16 Sep
Creating a social media strategy for your business? Here's how to get started: owl.li/oUZvr
 Promoted by HootSuite
Followed by Pardot Blogger Girl, Riley Walker and Show Me Leads.
Expand

 **Theworldface** @the_worldface 15s
Diez razones para tomar cerveza :: Theworldnews theworldnews6.webnode.es/news/diez-razo... via @webnode
Expand

 **Marketingfacts** @Marketingfacts 5m
Vandaag op M!: Netflix verslaat Pirate Bay tijdens de eerste vijf dagen in Nederland door @Marketingfacts marketingfacts.nl/berichten/netf...
 Retweeted by Affiliate Dave
 View summary

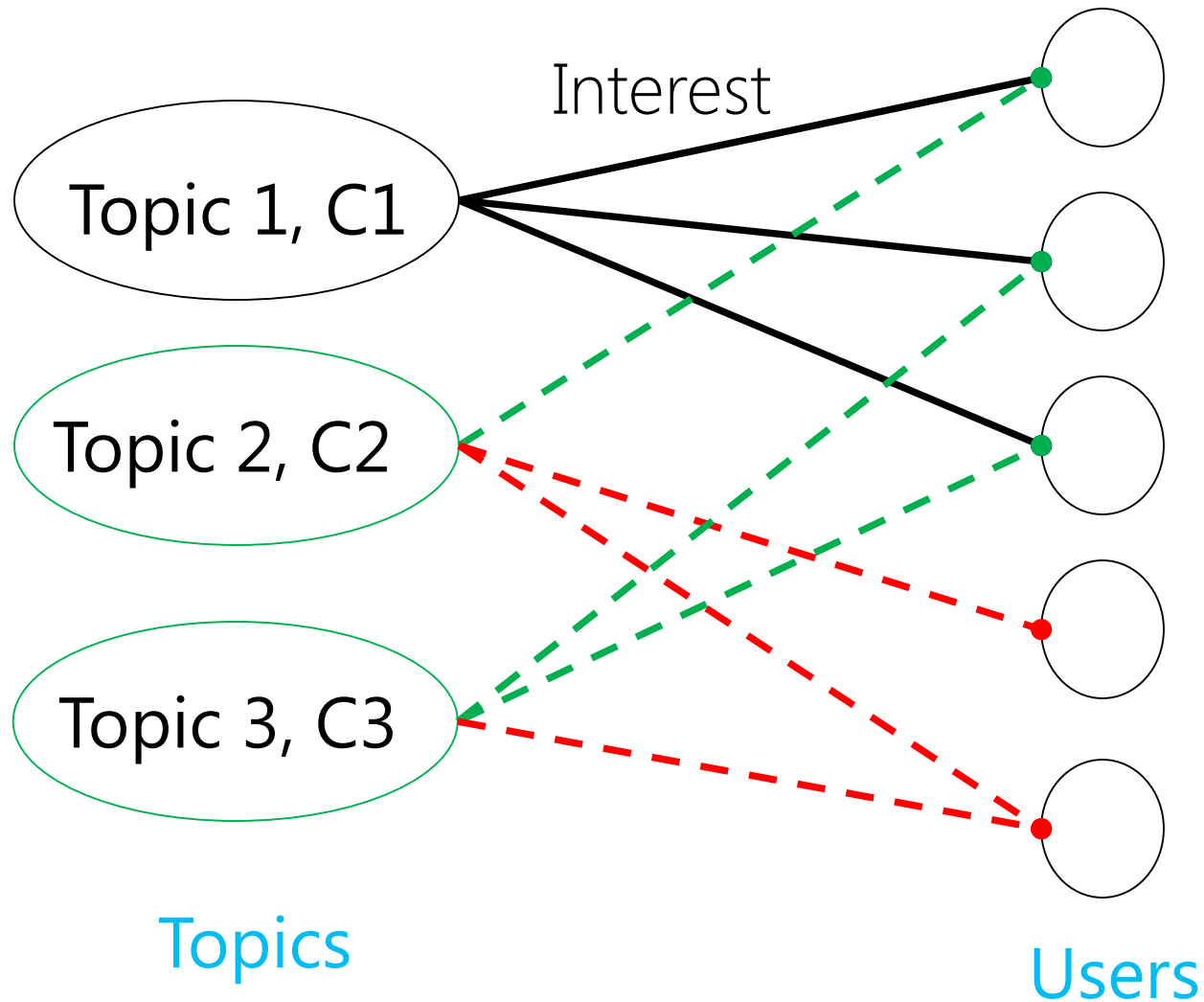
 **Internet Marketing** @TwitCreations 3m
Why Apple Fans Love to Wait in Lines (Hint: It's Not About the New iPhone) bit.ly/1fuKBPT
 Retweeted by Affiliate Dave
 View summary

Targeting Problem

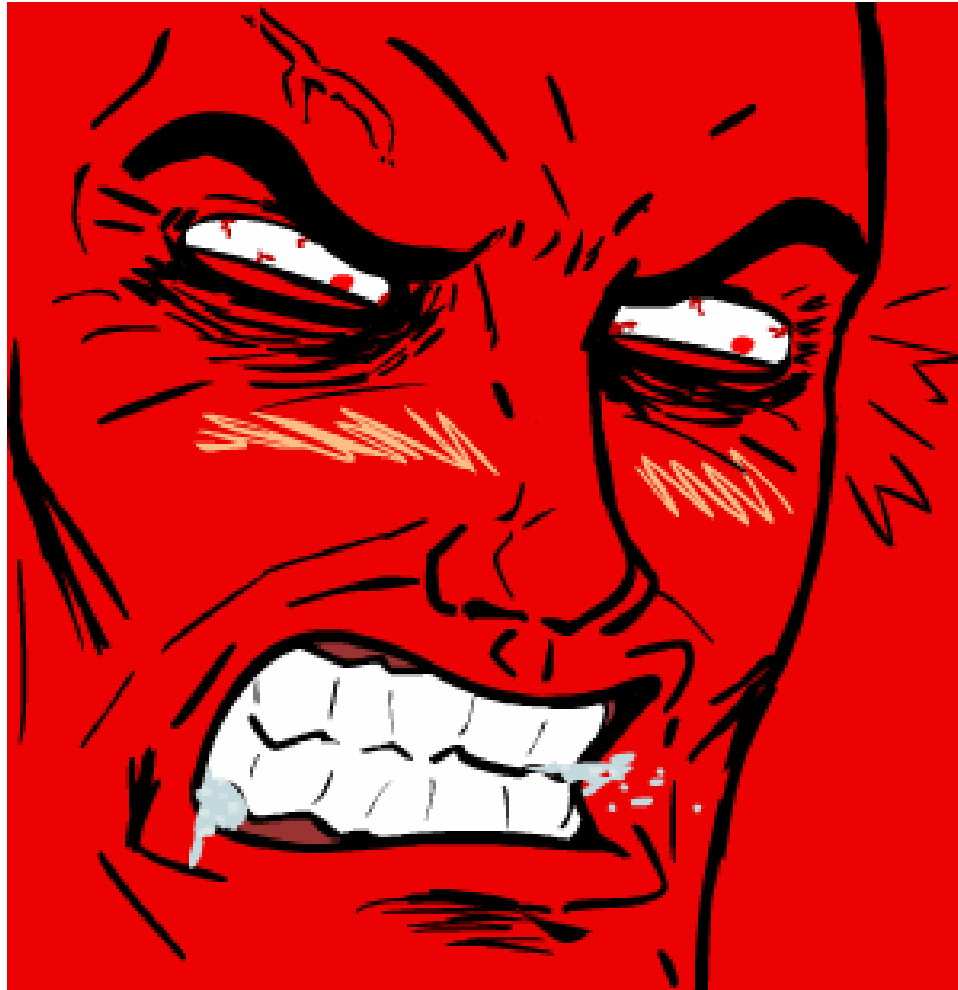
Pricing



Targeting Problem



Ad Rage



Targeting Problem

Input:

- Set of topics T
- User-Topic interest information
- t – topic to approximate
- S_t – target set of t
- B – Budget

Objective

- Select a set of alternate topics R that
 - ✓ covers as much of S_t as possible
 - ✓ within budget
 - ✓ doesn't spam uninterested users too much
 - ✓ Penalty (non-decreasing, convex)

Targeting Problem

Table 1: Case Study of Alternate Topics (the words are stemmed)

Machine Learning	Fashion	Social Media
strata machinelearn(ing) ai info engin(e) ai ppl researchnew nosql nlp ml inform(ation) retriev(al) analytics research data dev data analyt(ics) aier fourtytwo data scientist	beauti fashion fashion peopl style fashion fashion blog shoe fashion world apparel stylist fashion brand	market pr socialmedia communiti seo blog onlin(e) market

Solutions

- Targeting problem: NP-hard
 - Reduction: Set Cover problem
- Approximation algorithms
 - Tight Greedy (TG)
 - Fast – accurate
 - Tight Greedy on a basis of 3 (TG3)
 - Slower – more accurate

Intuition

❖ TG

- ✓ A : Pick topics with $\max \frac{\textit{marginal coverage}}{\textit{marginal cost}}$
 - Consider *the penalty cost* in marginal cost
 - until the budget is exhausted
- ✓ B : Locate the topic with max coverage
- ✓ Compare A and B

$$\text{Apx bound: } 1 - \frac{1}{\sqrt{e}}$$

Intuition (Cont'd)

❖ TG3

✓ A :

➤ Pick all subsets of 3 topics

➤ add topics with $\max \frac{\text{marginal coverage}}{\text{marginal cost}}$ to each subset

✓ B : The subset of 3 topics with max coverage

✓ Compare A and B

Apx bound: $1 - 1/e$

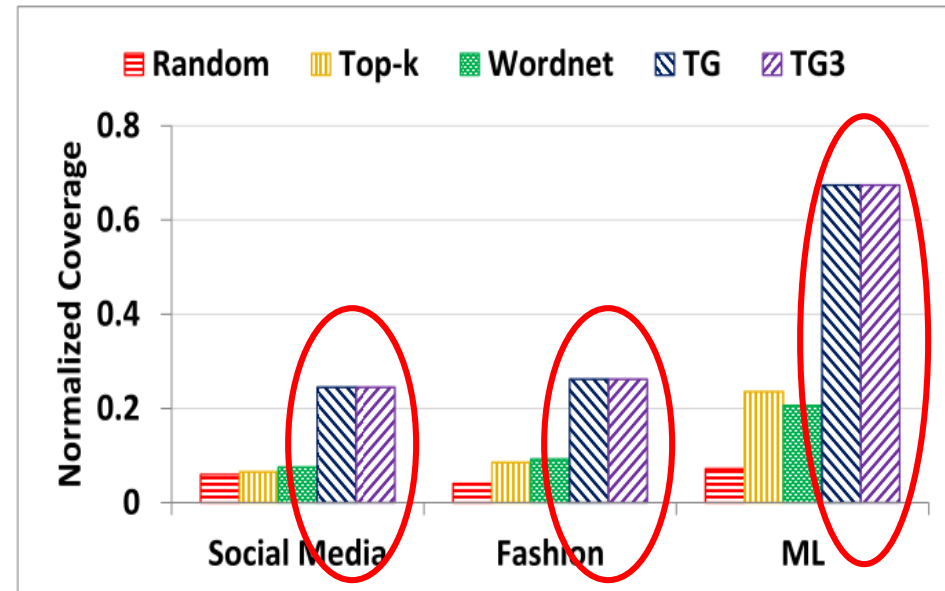
Experiment Details

Dataset

- Twitter lists (4.5M topics, 13.5M users)

Baselines

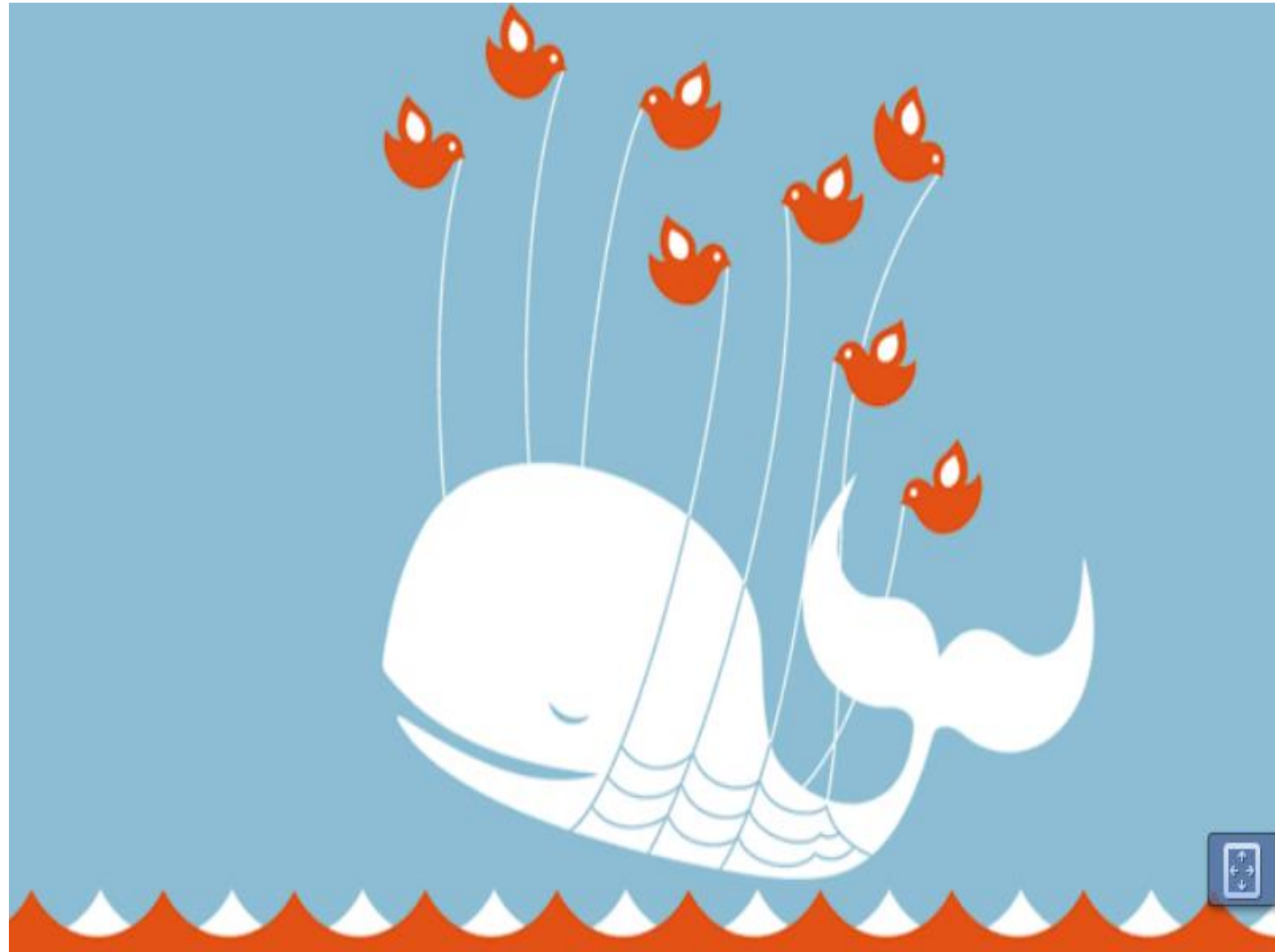
- Random, Top-k, WordNet



Conclusion and Future Works

- Possible to choose alternative cheaper topics with approximately same audience
- Fair cost distribution (when the technique is adopted)
- Study the equilibrium state when all advertisers adopt this strategy

Questions?



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