Society for Industrial and Applied Mathematics

Graphical Modeling of Macro Behavioral Targeting in Social Networks

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What is MBT?

Macro Behavioral Targeting (MBT):

Non-personalized broadcasting efforts that appeal to a massive targeted interactive population under competition from rivals for limited influence over the same population.

- Facebook posts – sent to fans
- Twitter tweets – sent to followers

User feedback features

- User behavior modeled by Gamma distribution

Table 3: Feature vector for individual feedback.

user_id	each user_id corresponds to a prior Gamma distribution according to the user parametrization.
time_since_last	the wait time in minutes since an effort is launched until user makes her feedback
feedback_sentiment	sentiment label for the feedback message.
[positive_list / negative_list]	[true if word is used in feedback text]

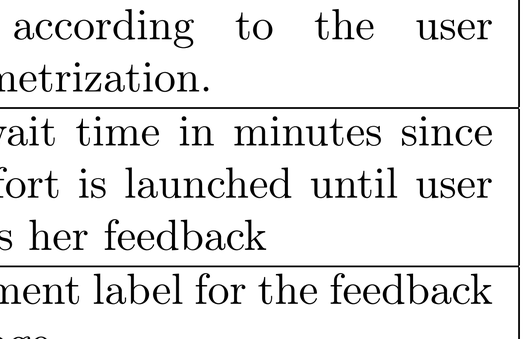
Brand effort features

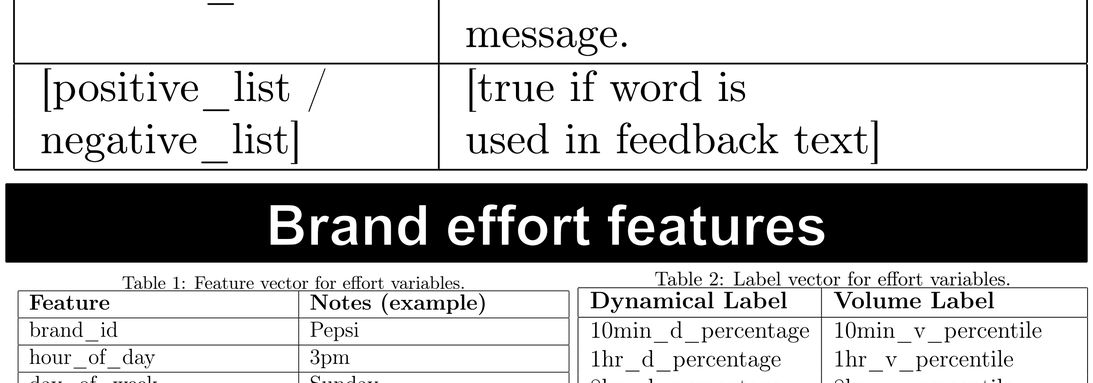
Table 1: Feature vector for effort variables.

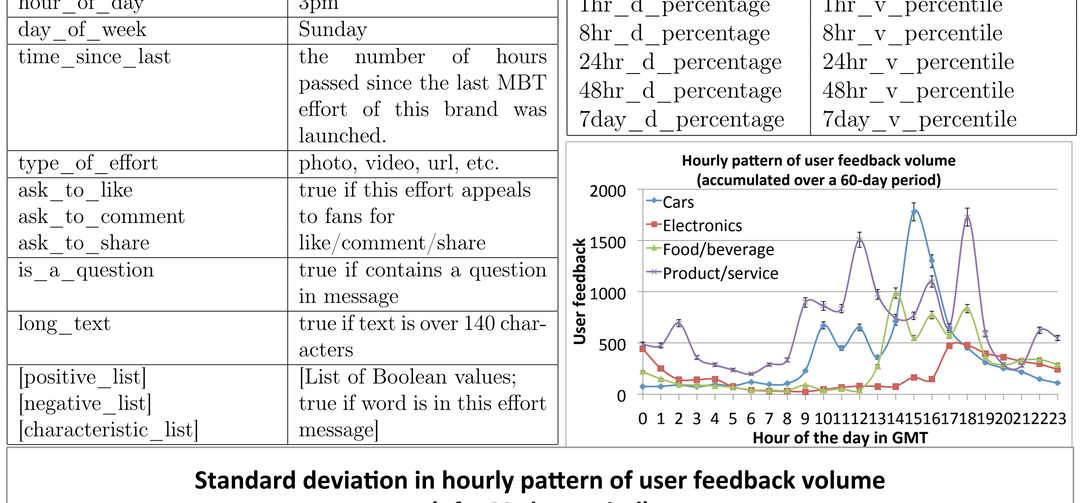
Feature	Notes (example)
brand_id	Pepsi
hour_of_day	3pm
day_of_week	Sunday
time_since_last	the number of hours passed since the last MBT effort of this brand was launched.
type_of_effort	photo, video, url, etc.
ask_to_like ask_to_comment ask_to_share	true if this effort appeals to fans for like/comment/share
is_a_question	true if contains a question in message
long_text	true if text is over 140 characters
[positive_list] [negative_list] [characteristic_list]	[List of Boolean values; true if word is in this effort message]

Table 2: Label vector for effort variables.

Dynamical Label	Volume Label
10min_d_percentage	10min_v_percentile
1hr_d_percentage	1hr_v_percentile
8hr_d_percentage	8hr_v_percentile
24hr_d_percentage	24hr_v_percentile
48hr_d_percentage	48hr_v_percentile
7day_d_percentage	7day_v_percentile







How is MBT different from traditional behavioral targeting

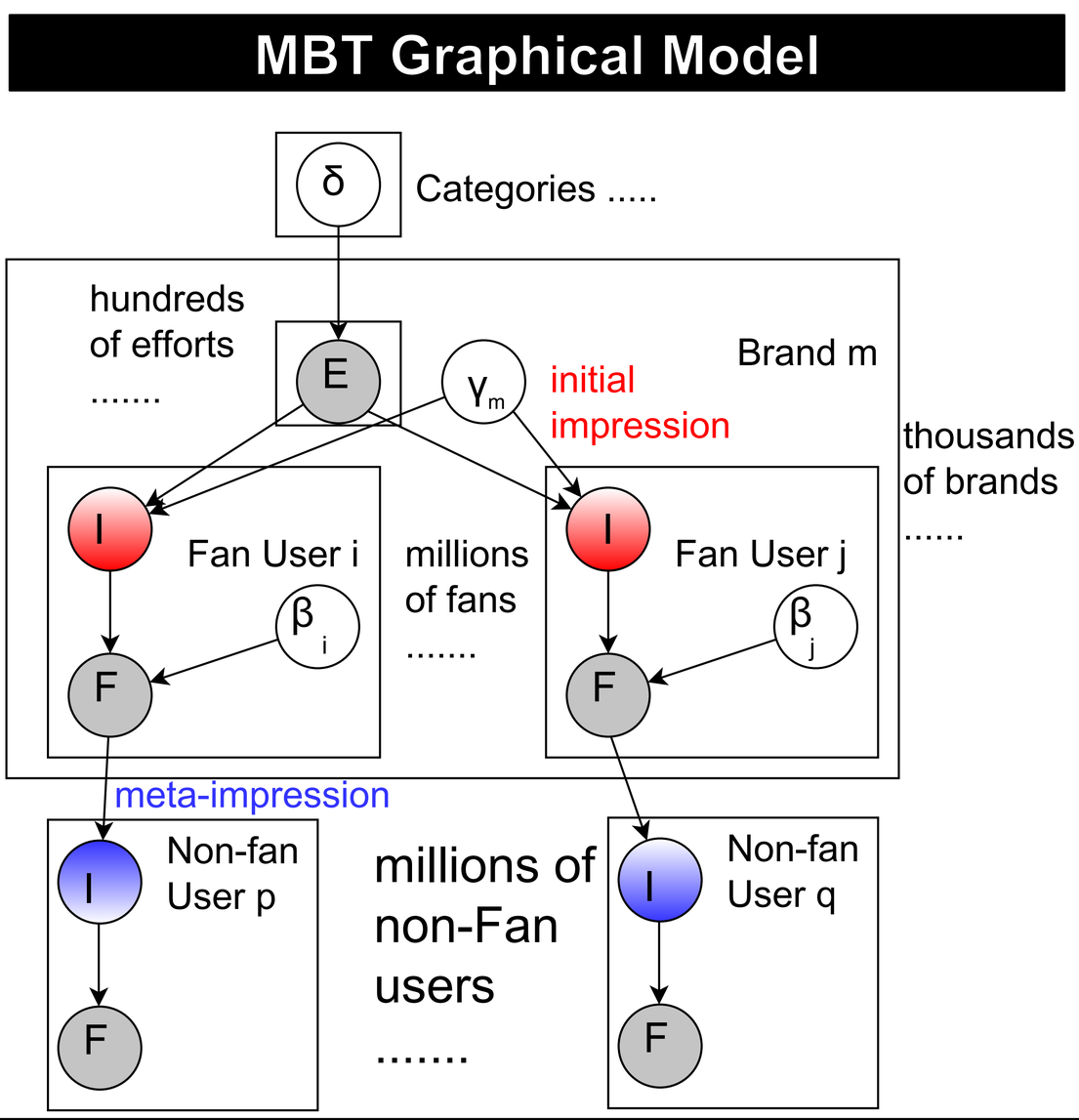
Competition structure

- Visible auctions (Pepsi can see Coke's engaging activities on Facebook and vice versa)
- Visible metrics (any Facebook user sees the campaign performance)
- e.g., Google Adwords is very different

Viral effect

- Gmail ads clicks are not social/viral
- The Like button on Facebook is viral

MBT Graphical Model



Experiments

Table 4: Facebook dataset basic statistics.

Category	Electronics	Food beverages	Product service	Cars
Brands	34	346	614	91
Efforts	19.4K	169.4K	424.6K	46.2K
Feedback	1.49M	13.8M	21.0M	2.24M
Total fans	2.45M	5.42M	28.3M	13.3M
Active fans (%)	353K 14.4%	410K 7.51%	1.02M 3.61%	721K 5.40%
Feedback_per_fan	4.20	33.7	20.5	3.12
avg_wait (minutes)	176.0	106.1	234.3	222.9
avg_sentiment	0.284	0.309	0.298	0.521
feedback_half_life (minutes)	41.6	47.0	72.1	71.9

Table 8: Phrases most correlated to effort popularity.

Category	Top Phrase	Correlation
Product/service	favorite	1.000
	friends	0.878
	app, apps	0.798
	win	0.704
	movie	0.680
	play	0.671
	share	0.642
	choice	0.579
	win	0.501
Electronics	free	1.000
	app, apps	0.827
	forever	0.749
	win	0.688
	share	0.612
	future	0.589
	amazing	0.571
	facebook	0.550
	삼성 (Samsung)	0.549