Mobile Targeting and Marketing Analytics

Xueming.Luo@temple.edu
GBM Center Director/Founder, Charles Gilliland Distinguished Professor
• **Mobiles** change how people live and work *(big data)*

• With “**when, where, and how**” precision targeting, managers use real-time big data to improve **customer value** proposition for higher **sales**.

• Uncover market trends and competitor intelligence *(company field experiment--causal sales impact)*.
Mobile Targeting New Findings

- Targeting by **geo-fencing and lead time**
- by **subway crowdedness**: mobile immersion
- by **geo-consquesting**: targeting consumes near competitor store
- by **Hour-by-hour mobile ads, Donation, Geo-social**, 
### Smartphone Users and Penetration Worldwide, 2012-2018

<table>
<thead>
<tr>
<th>Year</th>
<th>Smartphone Users (billions)</th>
<th>% Change</th>
<th>% of Mobile Users</th>
<th>% of Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>1.06</td>
<td>58.7%</td>
<td>25.8%</td>
<td>15.2%</td>
</tr>
<tr>
<td>2013</td>
<td>1.40</td>
<td>32.3%</td>
<td>31.9%</td>
<td>19.8%</td>
</tr>
<tr>
<td>2014</td>
<td>1.76</td>
<td>25.1%</td>
<td>37.8%</td>
<td>24.5%</td>
</tr>
<tr>
<td>2015</td>
<td>2.04</td>
<td>16.3%</td>
<td>41.8%</td>
<td>28.2%</td>
</tr>
<tr>
<td>2016</td>
<td>2.29</td>
<td>12.2%</td>
<td>45.0%</td>
<td>31.3%</td>
</tr>
<tr>
<td>2017</td>
<td>2.52</td>
<td>10.2%</td>
<td>47.7%</td>
<td>34.2%</td>
</tr>
<tr>
<td>2018</td>
<td>2.73</td>
<td>8.1%</td>
<td>49.8%</td>
<td>36.5%</td>
</tr>
</tbody>
</table>

Note: CAGR (2012-2018) = 17.0%; individuals of any age who own at least one smartphone and use the smartphone(s) at least once per month.

Source: eMarketer, June 2014

- China has the largest smartphone user base (Second = USA with 164 million).
Mobile Internet Usage

- Mobile users surpass desktop users
91% of mobile internet access is to socialize...

...compared to 79% on desktops

Source: Microsoft Tag
Mobile vs. Television

Mobile is the First Screen

People are spending more mins/day on mobile than television

- Italy
- France
- Japan
- Canada
- India
- Germany
- UK
- China
- Brazil
- Saudi
- Kenya
- USA
- Nigeria
- Indonesia

Daily Screen Minutes

50 100 150 200 250 300 350 400 450

Milward Brown AdReaction via Mary Meeker 2014 Internet Trends Presentation
<table>
<thead>
<tr>
<th>Technology</th>
<th>% of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cars</td>
<td>39%</td>
</tr>
<tr>
<td>Smart home appliances</td>
<td>34%</td>
</tr>
<tr>
<td>Heart monitors</td>
<td>23%</td>
</tr>
<tr>
<td>Pet monitors (e.g., GPS tracker)</td>
<td>22%</td>
</tr>
<tr>
<td>Fitness devices</td>
<td>22%</td>
</tr>
<tr>
<td>Child monitors</td>
<td>20%</td>
</tr>
<tr>
<td>Toys</td>
<td>19%</td>
</tr>
<tr>
<td>Drones</td>
<td>18%</td>
</tr>
<tr>
<td>Glasses</td>
<td>15%</td>
</tr>
<tr>
<td>Clothes</td>
<td>15%</td>
</tr>
<tr>
<td>Sports equipment</td>
<td>9%</td>
</tr>
</tbody>
</table>

Note: Internet of Things is internet-enabled consumer technology and devices; respondents were provided with examples of Internet of Things applications.

Source: SOASTA, "Internet of Things Survey," June 17, 2014
Big Data Mobile Advertising

• >74% of ad revenue of Facebook from mobile; 874 million users (1.19 billion) via mobile app

• >65% of Google ad revenue from mobile

• >84% of Twitter’s ad revenue from mobile
Uniqueness of Mobile Technology

Mobile Portability = Real-time Access

Ubiquitous access to consumers

84% US Smartphone users check phone first thing in morning

(SOASTA, 2013)
Location-based Real-time Mobile services

• Someone who tweets “I’m hungry” may see an ad for McDonalds.

Baidu/Alibaba/Tencent in the mobile networks
To enjoy a movie showing this Saturday at 4:00 pm for a reduced price, download this online ticket app to purchase your movie tickets and select your seat.
Distance x Time x Customer Scenario

Effectiveness of Mobile Targeting Strategies

NOTE: Error bars equal s.d.

Why? congruent consumer mindset with hedonic purchase

U-shape for far distances is robust across segments
Subway Crowdedness and Mobile Purchase

How does crowdedness affect consumer response to mobile targeting?
Our Expectation

Crowdedness *reduces physical space*, increases stress

Psychologically cope via *escape into mobile space*

*Mobile immersion* boosts mobile involvement, purchase
Results

Purchase Rate vs. Crowdedness as Passenger/m²

- 0.906
- 1.96
- 3.047
- 4.02
- 4.965

Purchase Rate increases with increasing crowdedness.

%:
- 2.5%
- 2.7%
- 2.9%
- 3.1%
- 3.3%
- 3.5%
- 3.7%
- 3.9%
- 4.1%
Endogeneity Threat? Traffic Intervention
Traffic Intervention Results

Crowdedness as Passengers/m²

Purchase Rate

1.0% 1.5% 2.0% 2.5% 3.0% 3.5% 4.0% 4.5%

2.11 2.72 3.05 3.54 3.99 4.13
No Upper Threshold
Mobile Ads Results

Response rates of utilitarian are highest in the morning, modest at noon, high in the afternoon, low during evening. Response rates of hedonic product are high at noon and afternoon, modest in the evening and low in the morning.
Consumer Segments

Subscribe to mobile news service = Function-oriented
Subscribe to mobile game service = Fun-seeking

Utilitarian-framing ad effectiveness is mainly driven by mobile news subscribers in morning hours

Hedonic-framing ad effectiveness is mainly driven by mobile game subscribes in afternoon hours
Geo-conquesting: Location-based Competitive Targeting

Nathan Fong, Zheng Fang, Xueming Luo
Experimental Design

3 • Targeting 3 locations
  – Near the focal retailer
  – Near a competitor location
  – Near a neutral location

×3 • Random assignment of promotion depth
  – e.g. 20%, 40%, 60% discount

×2 • Offer timing: now or next week

Hold-out randomized control baseline for each cell to identify effects of geo-consquesting

N=18,000, each cell 1k
Result

Focal Firm Location

Neutral Location

Competitor Location
Discount Response Curves

Competitive targeting: higher marginal effects for high discounts
Own targeting: lower marginal effects for high discounts
Cause Marketing (CM) and Price Discounts

Today: 15% off -- $5 to charity per shopper

Do discounts amplify or attenuate the impact of CM on purchase?
More Field Experiment Evidence

• Between-subjects design:
  
  2 (CM amount: none, 5 RMB) x
  3 (Discount: none, moderate = 30% off, deep = 50% off)

• 267 of 5,828 users downloaded app and bought tickets
  = 4.58%
• **Moderate** price discounts reinforce the effectiveness of CM donations
• **Deep** price discounts reduce the effectiveness of CM donations
CM & Moderate discounts help the firm & the charity!

**Firm Sales**
Revenues per Offer Sent
($, net of discounts and charity proceeds)

<table>
<thead>
<tr>
<th>No CM donation</th>
<th>Amount of CM donation</th>
</tr>
</thead>
<tbody>
<tr>
<td>No discount</td>
<td>Moderate discount</td>
</tr>
<tr>
<td>Deep discount</td>
<td></td>
</tr>
</tbody>
</table>

**Money to Charity per Offer Sent**
($)

<table>
<thead>
<tr>
<th>No CM donation</th>
<th>Amount of CM donation</th>
</tr>
</thead>
<tbody>
<tr>
<td>No discount</td>
<td>Moderate discount</td>
</tr>
<tr>
<td>Deep discount</td>
<td></td>
</tr>
</tbody>
</table>
Key Take-aways

• Moderate price discounts & CM = Win for all parties
  – Marketers (pleasant surprise: more bang with smaller buck)
  – Charity (earn more donations)
  – Customers (helping others and self-savings)

• Good news: managers can save some promotional $ and boost demand, while increasing the pie for charities
App Saves Life – Swedish CPR Service
Conclusion

• Precision targeting at each customer level (Company Field experiment).

• With “when, where, and how,” managers can improve customer value for higher business sales.

• Mobiles change how people live and work.
Conference on
BIG DATA MARKETING ANALYTICS:
October 31, 2014
The Gleacher Center, Univ. of Chicago

>>Discuss the effects of big data analytics on customers, brands, and business models.

>>Connect with scholars & practitioners in marketing, economics, and statistics

Conference Chairs: Pradeep Chintagunta (Chicago), Jean-Pierre Dubé (Chicago and NBER) and Xueming Luo (Temple)

Sponsors: ISMS, MSI
THANK YOU!

Xueming.Luo@temple.edu

FOX
GLOBAL CENTER FOR BIG DATA IN MOBILE ANALYTICS