Welcome to
NYU 2015 Conference on Digital Big Data,
Smart Life, Mobile Marketing Analytics

Conference Co-chairs:

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Fox School of Business, Temple University

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William H. Joyce Professor of Marketing
Stern School of Business
New York University
2015 Big Data Conferences

• Munich, Shanghai, Chicago

• Oct 23 at NYU Stern
  – Conf themes
  – Industry
  – Academic
The World Has Changed so is Customer Journey

50s 60s 70s 80s 90s 00s 10s

Consumer Buying Behavior: Process
Satisfaction and Loyalty
Services CRM
Market Ori Scanner data
CLV 1-to-1 UGC data
Mobile/ IoT Social media
Mobile = On-the-Go, smart IoT

- Smart Home
- Office
- Smart Wearables
- Smartphones
Omnichannel (offline - Mobile - online) Customer Journey

"0-moment" Mobile SEO

Mobile SEO

In-store

Store locator, call, QR, m-mapping
Try in store

SMS Coupon

Compare prices at rival stores
SMS opt-in $25 off

App Retargeting Mobile Share

App alerts
Mobile Wallet
Facebook likes
What is unique about mobile big data?

- **Personal-always me:** precise consumer profiling
- **Location contexts:** Physical + digital word
- **Real Time—always on:** Consumer behavior temporal
- **Rich interaction:** touch, shake, scan, movement, sensors

Provides marketers an enriched consumer behavior context
High opt-in Rate of Mobile Notification by Industry Verticals

Mobile Marketing Opportunity, despite Privacy Concerns
Mobile Meets MSI Tier 1 Priorities

Customer journey, engagement in a multi-media, multi-screen, and multi-channel era?

Mobile = physical + digital worlds
Hyper-local 24/7 ubiquitous engagement

Marketing analytics with big data, real-time decisions, causality of marketing?

2B smartphone users worldwide
Real-time pricing (Uber) and social m-commerce (WeChat)
Mobile Marketing Opportunity

- 2 billion people with smartphones worldwide
- Mobile ad spending $120B by 2018, > TV ad
- Influence 80% of $2.2T brick-and-mortar sales
- A hub for physical and digital worlds (OMO)

In-store mapping
Location services
M-Search
Apps
Uber Macy’s
M-Coupon
M-Social

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## Mobile Marketing Opportunity

### Current vs. Future* Usage of Mobile Marketing Tactics According to Marketers Worldwide, Q3 2014

<table>
<thead>
<tr>
<th>% of respondents</th>
<th>Currently use</th>
<th>Will use in the future*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile-optimized site</td>
<td>75%</td>
<td>15%</td>
</tr>
<tr>
<td>Mobile app</td>
<td>66%</td>
<td>16%</td>
</tr>
<tr>
<td>Mobile search</td>
<td>56%</td>
<td>20%</td>
</tr>
<tr>
<td>Outbound SMS/MMS</td>
<td>53%</td>
<td>19%</td>
</tr>
<tr>
<td>Mobile advertising</td>
<td>49%</td>
<td>28%</td>
</tr>
<tr>
<td>Mobile barcode (QR, SnapTag)</td>
<td>41%</td>
<td>20%</td>
</tr>
<tr>
<td>Geotargeting</td>
<td>40%</td>
<td>27%</td>
</tr>
<tr>
<td>Short-code SMS reply</td>
<td>39%</td>
<td>20%</td>
</tr>
<tr>
<td>Mobile commerce</td>
<td>37%</td>
<td>26%</td>
</tr>
<tr>
<td>Geofencing</td>
<td>16%</td>
<td>35%</td>
</tr>
</tbody>
</table>

*Note: among those already leveraging mobile; *within 24 months

Customer Journey Mobile Context Analytics Research Framework

Mobile Marketing Mix

- Product
  - App Uber
  - Macy’s
- Location
  - Hyper-local
  - Omni-channel
- Ad/Coupon
  - Geo-fencing
  - Ibeacon in-store
- Price
  - Freemium
  - App surge price
- User Journey
  - Smart prediction
  - Disco/Engage/Buy

Customer Journey Contexts

- Targeting any time local
- Weather, crowds
- Competition
- Geo-conquesting
- Privacy Personalization
- Global/Emerg markets
- Donation

Performance

Call to action
Branding
Conversion
ROI
Loyalty
User WOM
Network value

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Big Data Mobile Analytics Center Research Examples

- Geo-fencing and lead time: (2014 MgSc)
- Geo-conquesting: competitor (2015 JMR)
- Subway crowdedness: mobile immersion (2015 MkSc)
- Enduring effects of flash deals (2015 ISR)
- Hyper-competitive pricing (working)
- Donation self-signaling (working)
- Omnichannel couponing (working)
- App pricing and habit (working)
- **Weather** and Mobile Promotions: 10-million-users (working)
Motivation -- Weather Ads Examples
### App, Weather, and Demand

<table>
<thead>
<tr>
<th>Location</th>
<th>Weather Condition</th>
<th>Effect on in-store Purchasing (ex. Walmart, P&amp;G)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicago</td>
<td>Winter, Clear skies</td>
<td>Yogurt</td>
</tr>
<tr>
<td>Boston</td>
<td>Clouds, Wind</td>
<td>Chocolate</td>
</tr>
<tr>
<td>Houston</td>
<td>Wind, Humidity</td>
<td>String cheese</td>
</tr>
<tr>
<td>New York</td>
<td>Fall, Warm temperatures</td>
<td>Tires</td>
</tr>
<tr>
<td>Detroit</td>
<td>Humidity, Wind</td>
<td>Chips</td>
</tr>
</tbody>
</table>

*Mobile App 150 mm Location downloads*
Literature on Weather

• Weather affects 1/3 of GDP, across B2B B2C sectors
  – Restaurants, apparel, automotive, insurance, agriculture (Shah 2013)

• Shapes everyone’s activities and psychology
  – Sunlight produces serotonin, good mood (Lambert et al. 2002)
  – Rain leads to depression and crime (Hsiang, Burke and Miguel 2013)
Challenges and Spurious Correlations

• Cannot manipulate weather

• Weather confounded with geographic locations
  – New York vs. Florida
  – Deviations and changes in weather

• No-promotion baseline for incremental ad response

• Mood explanations

• Big/small data generalizability
Field Data: 10 Million Mobile Users

• Cannot manipulate weather
  • Quasi-experiment to randomize SMS ad exposures

  – SMS ads promoting a video-streaming service deal
    – Randomized treatment ads (prevention framing “Don’t miss the opportunity…”) vs. control ads (“Dear respected customer…”)
  – Holdout group
  – Dependent Variable: Purchase Ad
Field Data: 10 Million Mobile Users

• Cannot manipulate weather
  • Quasi-experiment to randomize SMS ad exposures
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Ad Copy Regulates the Sunny/Rainy Effects

Prevention ads: “Don’t miss the opportunity…”

Non-Prevention ads: “Dear respected customer…”
Table 3 Purchase Rate of Hourly Weather Conditions

<table>
<thead>
<tr>
<th>Condition</th>
<th>Purchase Rate</th>
<th>Number of Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hourly Sunny</td>
<td>0.00022</td>
<td>2643566</td>
</tr>
<tr>
<td>Hourly Cloudy</td>
<td>0.00016</td>
<td>2847163</td>
</tr>
<tr>
<td>Hourly Rainy</td>
<td>0.00013</td>
<td>2834813</td>
</tr>
<tr>
<td>Total</td>
<td>0.00017</td>
<td>8325542</td>
</tr>
</tbody>
</table>

Kaplan-Meier survival estimates
Passed More Robustness Checks

• Alternative Measure of Weather
  – Backward and forward looking weather
  – Amount of sunlight
  – Interaction with temperature

• Accounting for Behavior
  – Weekdays 9 am to 5 pm, hazard model
  – Mobile usage behavior
Conclusion and Future Directions

– Weather
  • Big and small data evidence for sunny/rainy days’ effects
  • Weather-neutral product, mood explanation

– Mobile Ads
  • Higher ROI
  • Designing ad copy

– Future research
  • Forecasts-based ads for online and offline omnichannel sales