Inferring the Impacts of Social Media on Crowdfunding

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Presenter: Chun-Ta Lu
Inferring the Impacts of Social Media on Crowdfunding

1. Introduction to “Crowdfunding”
2. Impacts of Social Media
3. Experiments
4. Conclusion & Future Works
FORM 1: An affordable, professional 3D printer
by Formlabs

Funded! This project was successfully funded on Oct 26, 2012.

2,068 backers
$2,945,885 pledged of $100,000 goal
0 seconds to go

Project by Formlabs
Cambridge, MA
Contact me

Website: formlabs.com
Impacts of Social Media on Crowdfunding

Unique properties: 1. fundraising goal 2. project duration
Impacts of Social Media on Crowdfunding

Unique properties: 1. fundraising goal 2. project duration
Impacts of Social Media on Crowdfunding

Unique properties: 1. fundraising goal 2. project duration
Dataset: Kickstarter and Twitter

### Dataset Characteristics

<table>
<thead>
<tr>
<th>Metric</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td># of projects</td>
<td>1,521</td>
</tr>
<tr>
<td># of successful projects</td>
<td>841</td>
</tr>
<tr>
<td># of backers</td>
<td>145,032</td>
</tr>
<tr>
<td># of tweets</td>
<td>62,473</td>
</tr>
<tr>
<td># of promoters</td>
<td>39,051</td>
</tr>
<tr>
<td># of patrons</td>
<td>16,666</td>
</tr>
<tr>
<td># of mentioned users</td>
<td>14,415</td>
</tr>
</tbody>
</table>

#### Pie Chart

- Film & Video: 32%
- Music: 21%
- Games: 18%
- Publishing: 12%
- Design: 10%
- Others: 7%

#### Transition of Roles in Crowdfunding

- Potential Target
- Backer
- Promoter
- Patron

- Solid lines show the action of broadcasting and dash lines show the action of investment.

- Mentions the project in tweets
- Invests in the project

#### Movie Category Distribution

- Music: 32%
- Film & Video: 21%
- Games: 18%
- Publishing: 12%
- Design: 10%
- Others: 7%

#### Project Categories Distribution

- Music: 32%
- Film & Video: 21%
- Games: 18%
- Publishing: 12%
- Design: 10%
- Others: 7%
Dataset Analysis: success rate

All-or-nothing policy: Projects either fail significantly or meet their goals by relatively small margins.
Dataset Analysis: success rate

All-or-nothing policy: Projects either fail significantly or meet their goals by relatively small margins.

44% of projects failed to reach goals
Dynamics of Crowdfunding

(1) Three phases of fundraising activities

Kickstarter

![Graph showing dynamics of crowdfunding with three phases: kickstart, ramp, and fall-off.](image)
(1) Three phases of fundraising activities

Kickstarter

(I) starting bursty phase

50% of funds from the first 25% of project duration.
Dynamics of Crowdfunding

(1) Three phases of fundraising activities

Kickstarter

(I) starting bursty phase
50% of funds from the first 25% of project duration.

(II) stationary phase
few activities happen in the middle 65% of project duration.
Dynamics of Crowdfunding

(1) Three phases of fundraising activities

**Kickstarter**

(I) starting bursty phase
50% of funds from the first 25% of project duration.

(II) stationary phase
few activities happen in the middle 65% of project duration.

(III) final bursty phase
the success rate of 60% of projects depend on the final 10% of project duration.
Dynamics of Crowdfunding

(1) Three phases of fundraising activities

Kickstarter

Twitter
Dynamics of Crowdfunding

(1) Three phases of fundraising activities

**Kickstarter**

- average number per project (count)

**Twitter**

- Patrons/Promoters (%)

**Social activities shift from promoting to investing**
starting bursty phase:
50% of funds from the first 25% of project duration.

Prediction Tasks:

(1) Predict number of backers (within 25% of project duration)

(2) Predict whether a project will succeed or fail (within 25% of project duration)
Features of early crowdfunding activities

**Project features (SA)**, 7 features total: project duration, elapsed days since the launch, fundraising goal, median amount of pledge options, number of backers, ratio of current raised funds to fundraising goal, and average amount of pledge per backer.

**Social activity features (SB)**, 6 features total: number of tweets, number of promoters, number of patrons, number of unique mentioned users, fraction of promoters from external stimulations, and fraction of patrons from external stimulations.

**Social structure features (SC)**, 7 features total: average number of followers of promoters, median number of followers of promoters, number of edges, diameter (largest shortest distance), number of connected components, number of triads, and global clustering coefficient.
(2) Correlations between features extracted in early stage and fundraising results

<table>
<thead>
<tr>
<th>Top 5 Features</th>
<th>project duration (%)</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>5</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td># of backers</td>
<td>0.82</td>
<td>0.89</td>
<td>0.92</td>
<td></td>
</tr>
<tr>
<td># of patrons</td>
<td>0.79</td>
<td>0.81</td>
<td>0.85</td>
<td></td>
</tr>
<tr>
<td># of promoters</td>
<td>0.77</td>
<td>0.78</td>
<td>0.79</td>
<td></td>
</tr>
<tr>
<td># of tweets</td>
<td>0.73</td>
<td>0.70</td>
<td>0.65</td>
<td></td>
</tr>
<tr>
<td># of connected components</td>
<td>0.70</td>
<td>0.69</td>
<td>0.68</td>
<td></td>
</tr>
</tbody>
</table>

Correlation of the total number of backers at target deadline and the features extracted at specified time.

number of backers is strongly correlated to promotional activity
(2) Correlations between features extracted in early stage and fundraising results

<table>
<thead>
<tr>
<th>Top 5 Features</th>
<th>project duration (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>raised funds/goal</td>
<td>0.77 0.89 0.95</td>
</tr>
<tr>
<td># of triads</td>
<td>0.47 0.46 0.45</td>
</tr>
<tr>
<td># of edges</td>
<td>0.43 0.43 0.38</td>
</tr>
<tr>
<td># of patrons</td>
<td>0.26 0.26 0.24</td>
</tr>
<tr>
<td># of backers</td>
<td>0.18 0.29 0.30</td>
</tr>
</tbody>
</table>

Correlation of raised funds/goal (%) at target deadline and the features extracted at specified time.

success rate is more related to the structure of promotional campaign
Experiments (Early Prediction)

(1) Predict number of backers (within 25% of project duration)

\[ mRSE = \frac{1}{|C|} \cdot \sum_{p \in C} \left[ \theta_t \cdot \frac{X(p, t)}{N(p)} - 1 \right]^2 \]

\( X(p, t) \): feature vector
Experiments (Early Prediction)

(1) Predict number of backers
(within 25% of project duration)

\[
mRSE = \frac{1}{|C|} \cdot \sum_{p \in C} \left[ \theta_t \cdot \frac{X(p, t)}{N(p)} - 1 \right]^2
\]

\(X(p, t)\): feature vector
(2) Predict whether a project will succeed or fail (within 25% of project duration)

A: Project features; B: Social activity features; C: Social structure feature
Experiments (Early Prediction)

(2) Predict whether a project will succeed or fail (within 25% of project duration)

A: Project features; B: Social activity features; C: Social structure feature

Over 75% accuracy using features within only 5% of project duration (2~3 days)
Conclusion & Future Work

1. Temporal distribution of attention is affected by both the freshness and the approaching deadline.

2. Fundraising results are more correlated to the social promotional activities rather than its own properties.

   (1) number of backers is strongly correlated to promotional activity

   (2) success rate is more related to the structure of promotional campaign

3. Qualitative analysis: why users invest in a project?
Related work in this session

   - Focus on the crowdfunding platform itself.
   - Key factors that encourage donation
   - Predict how likely a given lender will fund a new loan

2. Who Watches (and Shares) What on YouTube? And When? Using Twitter to Understand YouTube Viewership
   - Analyze correlated behaviors within Twitter and YouTube
   - Insights into who watches/shares what on YouTube, and when.
Multi-Transfer: Transfer Learning with Multiple Views and Multiple Sources

Presented by Zhiyuan Chen

Thank you!