Peer-to-Peer Markets

- Matching, search
- Flexible pricing (incl. auctions)
- Trust
Peer-to-Peer Markets

• Matching, search
• Flexible pricing (incl. auctions)
• Trust

• Today: trust!
  – Certification
  – Insurance
  – Reputation systems

Role of Reputation Systems

• Moral Hazard
  – Low quality action taken because of incentive misalignment.
    • E.g., seller doesn’t ship
  
• Adverse selection
  – Low quality agents enter a market because of incentive misalignment.
  – Asymmetric information
    • E.g., fraudulent sellers enter
Role of Reputation Systems

• Moral Hazard
  – Low quality action taken because of incentive misalignment.
    • E.g., seller doesn’t ship
  – *Reputation addresses via “sanctioning”*

• Adverse selection
  – Low quality agents enter a market because of incentive misalignment.
  – Asymmetric information
    • E.g., fraudulent sellers enter
  – *Reputation addresses via “signaling”*

What’s required for a well functioning reputation system?

1. Sellers *change action* because of the link between behavior and future reputation.
2. The publicly reported information *reflects the past* (requires unbiased ratings).
3. Buyers *correctly interpret* the reputation information.
The design space

• One-way or two-way?
• Sequential-reveal or Simultaneous-reveal?
• Restricted, Anyone, or Required?
• Incentives to report, not to whitewash?
• What information to collect, what information to make public?
• Whether to also have private feedback, private messaging?

Examples

<table>
<thead>
<tr>
<th>Platform</th>
<th>direction</th>
<th>who</th>
<th>elicit</th>
<th>incentives</th>
</tr>
</thead>
<tbody>
<tr>
<td>eBay (1.0)</td>
<td>2-way (seq)</td>
<td>restrict</td>
<td>{+, o, -}, text</td>
<td>no</td>
</tr>
<tr>
<td>Amazon</td>
<td>1-way</td>
<td>restrict</td>
<td>stars, text</td>
<td>no</td>
</tr>
<tr>
<td>Yelp</td>
<td>1-way</td>
<td>anyone</td>
<td>stars, text</td>
<td>no</td>
</tr>
<tr>
<td>Airbnb</td>
<td>2-way sim</td>
<td>restrict</td>
<td>stars, text</td>
<td>no</td>
</tr>
<tr>
<td>Uber</td>
<td>2-way seq</td>
<td>require</td>
<td>stars</td>
<td>future use</td>
</tr>
<tr>
<td>Digg</td>
<td>1-way</td>
<td>anyone</td>
<td>vote</td>
<td>no</td>
</tr>
<tr>
<td>Google Local Guides</td>
<td>1-way</td>
<td>anyone</td>
<td>stars, text</td>
<td>yes</td>
</tr>
</tbody>
</table>

Figure 20.1.: The design features of some real-world reputation systems.
eBay Feedback 1.0

Airbnb

Public info on a listing  Rating of host (public and private)  Rating of guest (private)
Google Local Guides

Figure 20.8: Google Local Guides: Crowdsourced Feedback with Points.

Reputation Game
Feedback Bias

• Negative ratings may be more costly to leave than positive ratings. Why?
• Leads to feedback bias
  – non-participation
  – omitted, false information if do make a rating

eBay F1.0 (pre 2007)

<table>
<thead>
<tr>
<th></th>
<th>1 month</th>
<th>6 months</th>
<th>12 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>40</td>
<td>199</td>
<td>396</td>
</tr>
<tr>
<td>Neutral</td>
<td>0</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Negative</td>
<td>3</td>
<td>4</td>
<td>6</td>
</tr>
</tbody>
</table>

$$PP = \frac{n_{pos}}{n_{ratings}}$$

- 67% had PP = 1.0
- 80% had PP >= 0.99
Pre-2007 Design

- Both parties can both leave \{-1, 0, +1\} feedback
- Sequential-reveal: can see feedback by other party before leaving own feedback.

- Q: Why would eBay want feedback from the Seller to the Buyer?

(Bolton, Grenier & Ockenfels'11)
Lab experiment (2007)
(Bolton, Grenier & Ockenfels’11)

- Simultaneous (blind) reveal
  - Seemed to help, but did reduce quantity

- Detailed seller ratings (anonymous, delayed until deadline or S2B rating)
  - Seemed to help
  - Didn’t reduce quantity
  - DSR scores correlated with quality

eBay Feedback 2.0 (2007+)

- Only from B to S; only published after S has given S to B feedback (or at deadline)
Example Purchase (2013)

Reputation system (2013)
DSR vs CF ratings

Distr of Average Scores
Distr of Average Scores

2008 onwards
eBay Feedback 3.0 (Spring’08)

• Problem with F2.0: internal click logs show only 1% of buyers look at DSR information!

• Change: restrict sellers to only providing positive feedback about buyers.
• Still sequential-reveal, but no punishment possible by seller.

2011 onwards
Feedback Bias Persists!
(Nosko and Tadelis’15)

• Despite “3.0”, 2011-14 data shows median PP = 1.0 and mean PP = 0.99
• Look at October 2011 transactions:
  – 0.4% negative feedback
  – 1% dispute ticket, ~3.4% unsat if include low DSR as evidence
  – (June’11 study found 3.3% post-tx B2S messages were neg.)
• Still seems to be a bias. Threats?

Effective Percent Positive
(Nosko and Tadelis’15)

\[ PP = \frac{n_{pos}}{n_{ratings}} \quad \text{EPP} = \frac{n_{pos}}{n_{tx}} \]

Data on sellers associated with a 2011 cohort of eBay buyers

Dec 2011 experiment. Promote EPP in listings. Find that buyers significantly more likely to repeat purchase within 180 days.
2016 onwards

• Feedback 4.0?

Related Airbnb redesign

(Fradkin et al. 2016)

• Sequential-reveal before May’14
  – Seems to be working ok, though
  – 97% of guests privately recommend the listing. Of these, 74% 5* and 20% 4*.
  – When guests did not recommend, <5* over 90% of the time

• Ran experiment, May and June 2014
  – Simultaneous-reveal (blind) design
    • Guests +2% feedback, Hosts +7% feedback
    • Guests -1.6% five star, Hosts -0.4% five star

• Airbnb now uses simultaneous-reveal
Summary

• Reputation systems have a crucial role in trustworthy peer-to-peer markets
• A large design space
• Biased reporting can be a concern, prompting investigation of sequential- vs simultaneous reports; also use of private messaging to allow platform to gain better information.