The Economics of E-commerce and Technology
Reputation

- Reputations are essential with experience goods
  - Where experience good after buying
- Reputation performs two functions
  - Allow people to learn about quality of product
  - Discipline bad behavior
- Offline
  - Long term relations, word-of-mouth, legal system
- Online reputation mechanisms
  - eBay – buyers and sellers rate each other
  - Yelp – customers review restaurants
  - Peer-to-peer networks – rate user’s contribution to system
Reputation Mechanisms

- Challenges
  - Encourage participation
  - Extract accurate, useful information
  - Avoid strategic manipulation

- Information technology allows for precise management
  - What type of information is solicited?
  - When should it be solicited?
  - How is information aggregated?
  - What information is made available, and to whom?

- Examples
  - Detailed information (surveys) vs. positive/negative?
  - How filter out suspect reviews? Weight by trustworthiness?
  - Provide recent reviews or entire history? (eBay vs. Yelp)
Reputation and eBay

- eBay has first-mover advantage
  - Does not guarantee success: Altavista, WordPerfect
  - Reputation system is key part of success

- Reputation system protects buyers
  - Is good delivered promptly?
  - Is good as described?
  - Outright fraud?

- System creates switching costs for reputable sellers

- More important as eBay increases high-values sales
  - Art, cars, houses, land
How Valuable is Seller Reputation?

- Reputation is useful [for postcards]
  - Having 2000 positive feedbacks and 1 negative yields 8% higher prices than having 10 positive feedbacks
  - When have little feedback, negatives make little difference. Reflects cheapness of online profiles.

- After receive first negative feedback
  - Weekly sales rates go from +7% to -7%
  - Subsequent negative feedback arrives 25% more rapidly

- Seller exit
  - Exit more likely when reputation is low
  - Just before exit, sellers receive lots of negative feedback
How Valuable is Seller Reputation?

- It’s also valuable to be a “powerseller” or a “store”.
- Saeedi (2012), looks at iPod prices:

<table>
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<th>Average Prices</th>
<th>Fitted Values</th>
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<tr>
<td></td>
<td>All iPods</td>
<td>New iPod Nano</td>
</tr>
<tr>
<td>All Sellers</td>
<td>$131.81</td>
<td>$132.95</td>
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<td>Non-Powersellers &amp; Non-Store Stores</td>
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<tr>
<td>Powersellers &amp; Stores</td>
<td>$139.90</td>
<td>$135.29</td>
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Does Reputation Work?

- Baseball card market on Ebay
  - Graded card: Ken Griffey Jr worth $1200 for 10, $150 for 9, $60 for 8.
- Graded market
  - Reputation of seller doesn't matter.
- Ungraded market
  - Higher claims lead to higher prices: $90 for 10, $70 for 9, $50 for others.
  - 10 claim not credible: should get card graded
  - When tested, quality independent of claims.
  - High claims had higher frauds (hit and run strategy).
  - Buyers and sellers of 10's less experienced
- Role of eBay reputation
  - High reputation less likely to claim “10”
  - Raises probability of sale, but not prices
  - Fixing claim, reputation has no effect on quality, lowers prob of fraud
Mutually positive feedback (N=451,227)
Only buyer left bad feedback (N=2,884)
Mutually bad feedback (N=5,279)
Only seller left bad feedback (N=357)
Problems with Ebay Reputation

1. Feedback not sufficiently rich
   - Feedback often concerns time to delivery, not quality of card
   - Detailed review expires after 90 days

2. Easy to build up reputation
   - Market for feedback: buy “positive feedback book” $0.25
   - Build up as buyer, then become seller

3. Feedback is bilateral
   - Buyers fear retaliation from sellers

4. Reputation could be more informative
   - Weight by value of transaction
   - Weight by experience of buyer
   - Weight by recentness
Reputation and Learning

- Reputation provides information about underlying quality
  - Helps solve “adverse selection”
  - Epinions, Amazon’s reviews

- Example: Product is ‘high’ or ‘low’ quality with equal prob
  - High product yields $v=10$ with prob $\frac{3}{4}$, and $v=0$ with prob $\frac{1}{4}$
  - Low product yields $v=10$ with prob $\frac{1}{4}$, and $v=0$ with prob $\frac{3}{4}$

- First customer
  - Willing to pay: $\Pr(\text{high})U(\text{high}) + \Pr(\text{low})U(\text{low}) = $5$

- Second customer (if first liked product)
  - Bayes rule: $\Pr(\text{high}|v_1=10) = \frac{3}{4}$
  - Willing to pay: $\Pr(\text{high})U(\text{high}) + \Pr(\text{low})U(\text{low}) = $6\frac{1}{4}$
  - What if first did not like the product?
Reputation and Discipline

- Reputation punishes bad behavior ("moral hazard")
  - Helps overcome eBay rating, restaurant hygiene
- Firm chooses high effort (cost \( c_H \)) or low effort (\( c_L \))
  - Benefit to customers: \( v_H > v_L \). But agent does not see effort.
  - Firm then chooses price to charge agent.
  - Assume high effort is socially optimal: \( v_H-c_H > v_L-c_L \)
- What happens in one-shot game?
- Repeated game with discount rate \( \delta \)
  - Suppose customers use "grim trigger" punishment: Pay up to \( v_H \) if never cheated; only pay \( v_L \) if ever cheated before
- High effort sustainable if firm patient (i.e. \( \delta \) high):
  \[
  \frac{1}{1-\delta} (v_H - c_H) \geq (v_H - c_L) + \frac{\delta}{1-\delta} (v_L - c_L)
  \]
Punishment schemes

- Is punishment severe enough to deter defection?
- Is punishment credible? Subgame perfect? Renegotiation proof?
  - Is punishment optimal after defection?
  - Credible not to renegotiate?
- When to punish?
  - Is deviation deliberate or by mistake?
- How do you recover from mistakes?
Cooperation harder to enforce when:

- Harder to detect defection (e.g. more randomness)
- Longer to detect defection (e.g. time to review)
- Harder to coordinate punishment (e.g. diffuse community)
- Higher benefits from defection (e.g. high value goods)
- Demand high (e.g. selling Wii’s before Christmas)
- Firm is less patient (e.g. firm is failing)
- Re-entry is easy
- Ambiguity about what is acceptable behavior
Eliciting Feedback

The Hobbit: An Unexpected Journey (2012)

**Your rating:** 9.3/10

Ratings: 9.3/10 from 4,437 users
Reviews: write review

A curious Hobbit, Bilbo Baggins, journeys to the Lonely Mountain with a vigorous group of Dwarves to reclaim a treasure stolen from them by the dragon Smaug.

**Director:** Peter Jackson
**Writers:** Fran Walsh (screenplay), Philippa Boyens (screenplay), and 3 more credits
**Stars:** Martin Freeman, Ian McKellen and Richard Armitage

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Designing Reputation Mechanisms

- What type of information should be solicited?
  - Positive/negative (Rotten Tomatoes), ratings out of 5 (Yelp), detailed surveys (eBay), freeform (Yelp)

- How encourage participation
  - Pay for feedback (Angie’s List), prestige (Yelp), Matching (Netflix)

- How obtain high quality reviews?
  - Review the review (Yelp), or review the reviewer (Amazon).

- How prevent strategic manipulation?
  - Cross-check reviews, Use robust statistics

- How is information aggregated?
  - Weight more recent higher? Weight reviews by rating?

- Punishing bad behavior
  - Make re-entry harder, reduce time until reviews posted
The Trust Business

- For many firms their reputation is most important asset
  - Financial firms (banks, life insurance, market makers)
  - Experience goods (Intel, Odwalla, Toyota)

- Banks
  - Banks invest money in long-term projects (e.g. mortgages)
  - If people believe bank will fail, this causes bank run
  - Failure becomes self-fulfilling

- Intel
  - In 1994 covered up Pentium bug
  - Refused to replace when discovered

- Odwalla
  - E. coli outbreak in 1996, led 66 people to become sick
  - Recall cost $6.5m (revenue $59m) and started to pasteurize
Enron

- Market cap of $60bn at end of 2000
  - Hid $8bn of debts and went bankrupt by end of 2001
  - Why aren't profitable parts of Enron still in business?

- Enron's Business
  - Long-term contracts for natural gas (and chemicals, metal etc)
  - Enron acted as middleman - party to every transaction
  - Every trader has credit exposure to Enron

- What happened?
  - At start of scandal Enron started to look shaky
  - Bid-Ask spread widened because of credit risk
  - Enron's profits fell, further increasing credit risk

- Lesson: loss of trust cannot be contained
  - It can spill into all aspects of firm's operations