The Economics of E-commerce and Technology

Platform Markets

11/4/2016

Platform markets

‣ A platform brings together groups of users.

‣ Examples:

  ‣ Real world: Credit cards, HMOs, Shopping malls

  ‣ Technology: operating systems, video games, DVDs

  ‣ Online: Web search, Amazon marketplace, iTunes.

‣ Same-side network effects

  ‣ Negative: An Xbox developer prefers less competition.

  ‣ Positive: An Xbox user prefers more users.

‣ Cross-side network effects

  ‣ An Xbox user prefers more developers.

Platform markets

▸ **Platforms differ from traditional retailers**

  ▸ Pays for goods up-front, eliminating coordination problem.

  ▸ Assume platform has all bargaining power (but Intel, EA)

▸ **Three-sided network**

  ▸ YouTube: consumers, advertisers, content providers.

▸ **Platforms may be**

  ▸ Proprietary (XBox)

  ▸ Open (e.g. DVD standard or Android)

▸ **Platforms have varying degrees of compatibility**

  ▸ Windows vs MAC in 1980s vs 2010s

Monopoly Pricing

Pricing

- There are 2 groups of agents, k=1,2
- Let n_k be population size, n_k^e be expected population size
  - Demand curve for group k is $p_k(n_k; n_1^e, n_2^e)$.
  - Fulfilled expectations demand is $p_k(n_k; n_1, n_2)$, where $n_k = n_k^e$.
  - Cost $c(n_1, n_2)$
- Firm chooses (n_1, n_2) to maximize profits,
  $$\pi = n_1 p_1(n_1; n_1, n_2) + n_2 p_2(n_2; n_1, n_2) - c(n_1, n_2)$$
  - Ignoring problem of multiple equilibria
- First order condition for n_1:

$$p_1(n_1; n_1, n_2) + n_1 \frac{\partial p_1(n_1; n_1, n_2)}{\partial n_1} + n_1 \frac{\partial p_1(n_1; n_1, n_2)}{\partial n_1^e} + n_2 \frac{\partial p_2(n_2; n_1, n_2)}{\partial n_1^e} = \frac{\partial c(n_1, n_2)}{\partial n_1}$$

Pricing

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$$p_1(n_1; n_1, n_2) + n_1 \frac{\partial p_1(n_1; n_1, n_2)}{\partial n_1} + n_1 \frac{\partial p_1(n_1; n_1, n_2)}{\partial n_1^e} + n_2 \frac{\partial p_2(n_2; n_1, n_2)}{\partial n_1^e} = \frac{\partial c(n_1, n_2)}{\partial n_1}$$

▸ Marginal benefit consists of four terms:

▸ First and second – same as standard MR curve

  ▸ Marginal and inframarginal effects of increasing quantity.

▸ Third – same side network effects

  ▸ How increasing n_1 raises value of marginal type-1 agent.

▸ Fourth – cross side network effects

  ▸ How increasing n_1 raises value of marginal type-2 agent.

Pricing: Lessons

▸ Subsidize those who create value for others

  ▸ Search engines subsidize users with free search and email.

▸ Typically platform have "money side" and "subsidy side".

  ▸ Example: Adobe gives pdf readers away free.

▸ Same side vs. cross side network effects

  ▸ Ladies night on Thursday but not Friday.

▸ Other considerations

  ▸ Attract marquee users (Macy's pays lowest rents in mall)

  ▸ Adverse selection (Westside rentals, TheLadders, eHarmony)

  ▸ Long run effect of prices (Mac vs. Windows)

  ▸ Mobilization (Charge zero to select equilibrium).

Details of fee structure

▸ The details of the fee structure varies across websites:

  ▸ Subscription fees (Westside rentals)

  ▸ Fee per posting (Craigslist)

  ▸ Fee per click (Price shopper)

  ▸ Sales commission (eBay)

▸ Choice depends on details. E.g. job postings

  ▸ What can platform observe?

  ▸ How much heterogeneity is there?

  ▸ Can system be gamed? Is there adverse selection?

▸ General idea: charge in units that agents care about.

  ▸ E.g. charge "per click" for display ad.

Competing

Competing

- Will there be unique winner?
    - Multi-homing cost
    - Strength of network effects
    - Desire for variety of platform
- Could you win a battle?
    - First-mover advantage
    - High expectations
    - Technology or cost advantage
- Should you share?
    - Network size bigger
    - Compete within market rather than for market.

Threat of envelopment

▶ Biggest threat may come from business vanishing

  ▶ Rival offers new functionality (e.g. gmail vs hotmail)

  ▶ Convergence of technology (e.g. iPhone vs iPod)

▶ Change business model

  ▶ Real lost server business to Windows

  ▶ Formed Rhapsody, charging customers for songs

▶ Form partnerships with other firms

  ▶ Become part of bigger bundle of services

▶ Sue

  ▶ Real sued Windows for $760m

Mobilizing a Platform Market

Barriers to Mobilization

- ## Standing risk (e.g. Zune)
  - Users may not make platform specific investments
- ## Holdup risk (e.g. Intel)
  - Concern platform increases prices after specific investments
- ## Integration risk (e.g. Nintendo)
  - Suppliers worries platform will start producing complements.
- ## Favoritism risk (e.g. Covisint)
  - Users worry platform will skew competition
- ## Relationship risk (e.g. Autobytel)
  - Suppliers don't want to lose control of customer relationship
- ## Competitive risk (e.g. B2B exchanges)
  - Suppliers don't want more intense competition

Penguin Problem

- Same strategies as with one-sided networks
    - Product announcements
    - Introductory discounts
    - Start with small networks
    - Obtain marquee users (exclusively?)
- Permanently subsidize one side
    - The subsidy side then turns up with high probability.
    - Examples: Westside Rentals; Monster.
    - Subsidy needs to overcome homing cost.
- Start as vendor or merchant and transition into platform

Transition: Vendor to Platform

‣ Firm starts as traditional vendor

  ‣ Makes and sells some product

  ‣ Shanda (online games), CNET (reviews)

‣ "More of the same" strategy (e.g. Schwab, mutual funds)

  ‣ Vendor supplements own product with 3rd parties

‣ "Something different" strategy (e.g. Google, AdSense)

  ‣ Add new functionality for second side of market

‣ Which side to start with?

  ‣ Start with side with weaker need for other side

  ‣ LinkedIn found employees before employers.

  ‣ YouTube (customers) vs. Brightcove (website support)

Transition: Merchant to Platform

- Firm starts as merchant
  - Devolves control of inventory, pricing and merchandising
  - Amazon (marketplace), iTunes
- Merchants have advantages over platform
  - Overcome penguin problem
  - Scale means that have lower costs on inputs
  - Retains control, e.g. combine complements to increase values
  - Sustain reputation for quality
- But a platform
  - Offers greater variety
  - Has much lowers costs, and no risk
  - Can be scaled quickly