The Economics of E-commerce and Technology

Platform Markets

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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

    ▸ competitive (DVD standard)

    ▸ proprietary (XBox)

    ▸ open (WiFi standard)

▸ Platforms may be compatible (Dell, Compaq) or incompatible (Windows, Mac).

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)

▸ Which one depends on fine details. For example:

  ▸ What can platform observe?
  ▸ How much heterogeneity is there?
  ▸ Can system be gamed? Is there adverse selection?

▸ Example: Overture and the simplicity of pay-per-click

  ▸ First position = 100 clicks, second = 25. Value click at $1.
  ▸ Pay-per-view: WTP is $100 if think first, $25 is think second.
  ▸ Pay-per-click: WTP is $1. Simplifies strategic interaction.

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
  - Combine complements to increase values
  - Sustain reputation for quality
- But platform offers greater variety