

The Economics of E-commerce and Technology

Platform Markets

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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- ▶ 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**