The Economics of E-commerce and Technology

Switching Costs and Lock-in

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Switching costs

- **Switching costs are ubiquitous**
  - Between brands (e.g. credit card companies)
  - Between technologies (e.g. operating systems)
- **Example: Bell Atlantic and AT&T**
  - In mid-1980s Bell invest in $3bn of AT&T switches
  - Proprietary technology, so needed AT&T for upgrades and fixes
  - Introducing '888' numbers cost Bell $8m for software
  - Annual upgrades cost $100m/year plus peripheral sales
- **Other examples**
  - Changing cell phone providers
  - Changing server software
  - Changing email address, internet service provider, phone company…

On switching costs

- Switching costs are two-sided
  - Customer switching costs: searching for new firm, learning new system, losing complementary investments etc.
  - Firm switching costs: setting up new account, hiring personnel
  - Total switching cost matters.
- Switching costs can be endogenous
  - Depend on compatibility decisions (e.g. number portability).
  - Can impose costs on departing customers (e.g. disruption)
  - Depends on users actions (e.g. queue in Netflix).
- Lock-in also faced by suppliers
  - Supplier lock-in: iPhone app maker and Apple.
  - Two-sided lock-in: coal mine and electricity plant

Why switching costs matter I

‣ The Valuation Principle:

    ‣ In homogenous good market, the discounted present value of a customer to firm = customers total switching costs.

‣ Model

    ‣ Competitive market has price $p^m=c$

    ‣ Firm A has N loyal customers with one-off switching cost k

    ‣ Time $t \in \{1,2,\ldots\}$ with discount rate δ.

    ‣ Customer willing to pay $p=c+k(1-\delta)$, otherwise will quit.

    ‣ This means profits equal $\pi=kN$.

‣ Hence switching costs tell you how much firm is worth

    ‣ Ignoring differentiation and costs differences.

Why switching costs matter II

- How much should you invest in installed customer base?
  - Promotions to acquire customers
  - Bribing customers to join you (e.g. credit cards)
- Idea: Verizon is trying to lure a new customer
  - Verizon makes profit $20/user/month.
  - Retain p=98% of customers per month. Discount rate δ=0.99
  - Lifetime Value (LTV) of customer is $20/(1-p\delta)$ = 671/user.
  - Switching cost for customer is $300; cost to firm is $50, so total customer acquisition cost (CAC) is $350.
  - Can buy customer $400 iPhone and make profit.
  - What about Sprint, where profit $15 and p=96%?

Lock-in cycle

- Four stages of lock-in
  - Important to anticipate entire lock-in cycle from the start
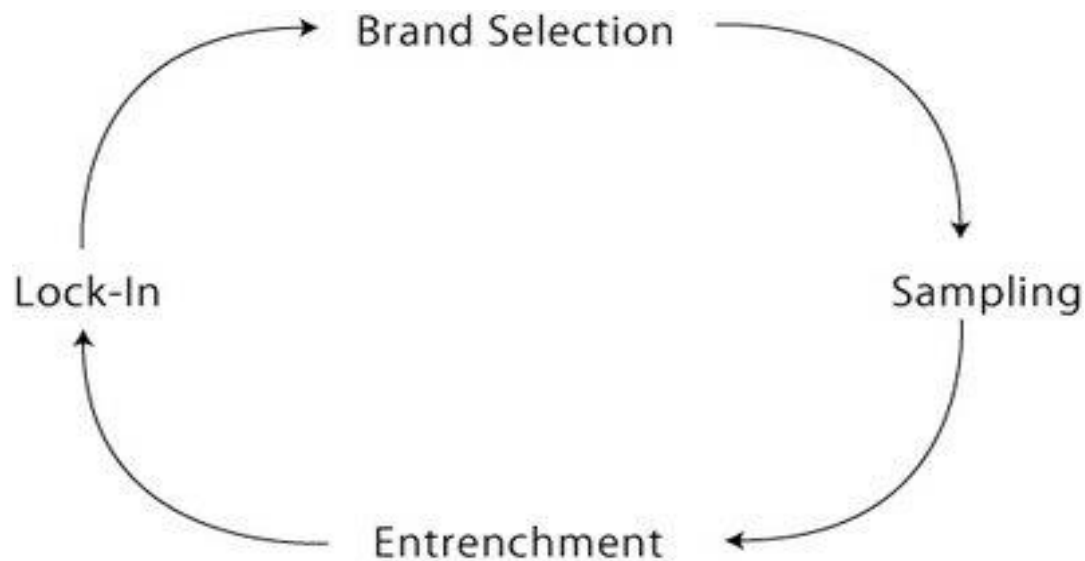 - Holds true for both buyers and sellers.

Figure : The Lock-In Cycle

Classifying Switching Costs

Classifying switching costs I

1. **Contractual commitments**
   - Cell-phone 2-year contracts and family plans.
   - Employments contracts
   - Anticipate switching costs after contract terminates
2. **Complimentary Investments**
   - Durable purchases (e.g. Xbox, printers),
   - Brand specific training (e.g. learning software, fixing airplane),
   - Complimentary purchases (e.g. iPad and Mac)
   - SC determined by: durability of assets/training, ease of resale, scale of investments, ease of leasing.

Classifying switching costs II

3. **Transactions costs**
   - Time and effort to make changes
   - Changing bank account or web browser.

4. **Search Costs**
   - Example: Yoga studios
   - Consumer search costs: time and effort to find good deal, evaluating product, risk of new seller (experience good)
   - Seller side: promotion, adverse selection

5. **Loyalty Programs**
   - Examples: Frequent flyer miles, supermarket cards, iDine
   - Loyalty benefits may increase (e.g. "gold" status)
   - Cooperate with other firms (e.g. win miles with credit card)

What type of switching costs?

▶ Google chrome

  ▶ Change settings in computer (complimentary investment)

  ▶ Unknown quality of other engines (search costs)

  ▶ Learning how to search effectively (training)

▶ Facebook

  ▶ List of friends (complimentary investment)

  ▶ Learning the interface (training)

▶ Apple iPhone

  ▶ Durable equipment (software)

  ▶ Learning the interface (training)

  ▶ Mac sales (complementary investment)

Buyers Strategy

Bargain Before Being Locked In

▸ Look for introductory offers

- ▸ Sign-up bonus, extended warranties, support in switching over

▸ Increase ex-ante bargaining power

- ▸ "My current system is fine"
- ▸ "I'll make lots of follow-on purchases"

▸ Beware of being held-up after committing

- ▸ Have price and quality carefully specified
- ▸ Seek long-term protection: service guarantees, free upgrades, most favored customer treatment
- ▸ Beware of non-contractible elements

▸ Be wary of vague commitments to being "fair" and "open"

The Holdup Problem

- Zappos wants to do deal with Fedex
  - Value of relationship: $V(x_F)$, where Z invests x_F in relationship
- Zappos has outside option to do deal with UPS
  - Value of outside option: $W(x_U)$, where Z invests x_U in option
- Socially optimal investment, assuming V>W
  - Investment in Fedex: $V'(x_F)=c'(x_F)$, where $c(.)$ is investment cost.
  - Investment in UPS: $x_U=0$
  - Can achieve this if write contract that gives gains to Zappos
- Negotiation: suppose Zappos and Fedex split gains 50:50
  - Profits: $\pi_Z=\frac{1}{2}[V(x_F)-W(x_U)]+W(x_U)$, $\pi_F=\frac{1}{2}[V(x_F)-W(x_U)]$
  - Under invest in Fedex: $\frac{1}{2}V'(x_F)=c'(x_F)$.
  - Over invest in UPS: $\frac{1}{2}W'(x_U)=c'(x_U)$.

After Lock-in

- Dual sourcing
  - Use two companies to reduce hold-up (i.e. ex-post opportunism)
  - Toyota policy of two suppliers
  - AMD creation benefited both IBM and Intel.
- Beware of creeping lock-in from complementary purchases
  - Try to avoid completely committing
- Acquire information to help ex-post bargaining
  - Seller's suppliers.
  - Seller's cost information.
  - Details of production process.
- Use bond to help ex-post bargaining
  - E.g. "getting the factory knocked up" when outsourcing.

Seller Strategy

Invest in Installed Base I: Bribe Customers

- May have to fight hard for "free" customers.
- Consider model from earlier
  - Competitive market with marginal cost c.
  - N free customers at time t=0. Switching costs k after join firm.
  - Discounted profits: if win customers π_1=kN; if lose π_1=0.
- What is the equilibrium price in period 0?
  - Each firm will price p_0=c-δk and make profits π_0=0.
  - Called "rent dissipation postulate".
  - Examples: fewer ads at starts of movie, student discounts for computers, low profits on bottom line cars.
- How make money from switching costs without spending all money attracting consumers?
  - First-mover advantages.
  - Have complements that others lack.

Investing II: Sell to Influential Customers

- Gladwell's classification of key customers:
    - Connector – people who have lots of "weak ties"
    - Maven – people who accumulate knowledge
    - Salesmen – people who can persuade others
- Selling to A may lead to sales from B
    - Network effects (e.g. selling to division A within firm)
    - A has reputation for being informed (e.g. Walmart)
    - A may provide industry contacts (e.g. importer into the US)
- Agency problems
    - Professor, publisher and students
    - Businessman, airline and employer
    - Doctors, pharma firms and insurance company

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Calculating Klout

▸ Virgin America used Klout to identify influential customers and gave them free flight on new routes.
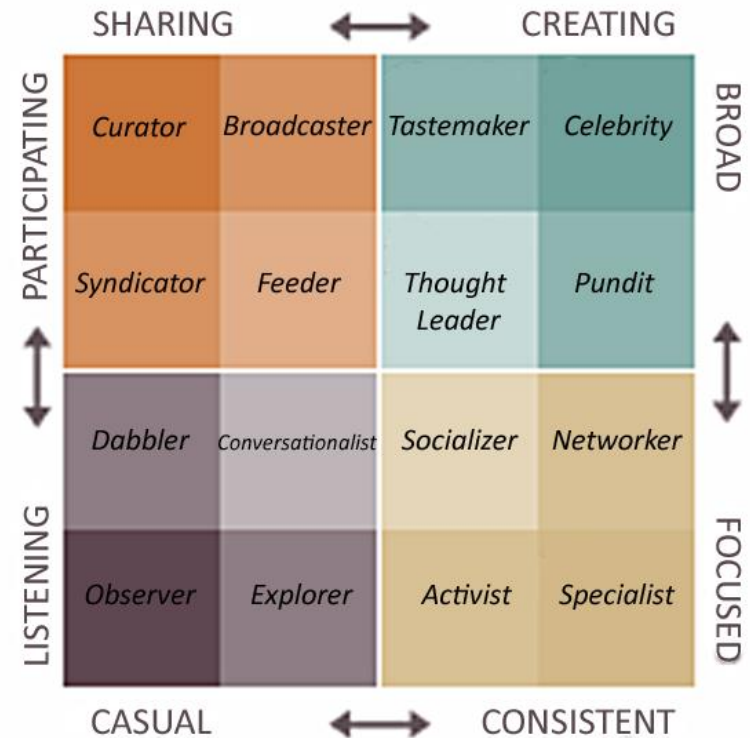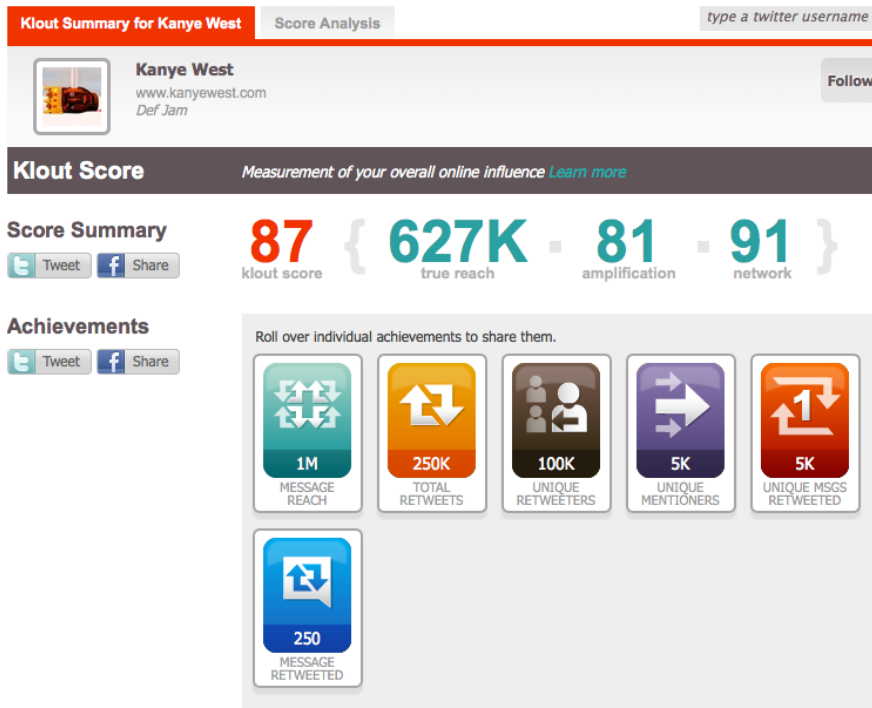
Encourage Entrenchment

- Design products to entrench
  - Open vs. closed system.
  - Mixed: basic version is free; advanced version is not.
- Loyalty programs
- Stagger contracts/sales
  - Minimal lock-in: when most contracts/equipment near end
  - Stagger contracts to strengthen weak link.
  - Example: Pitch product B when A halfway through life.
  - Example: Offer new phone contract after 20 months.
- Forward sales
  - Sell customer stock of black toner (but not color)

Minimal lock-in

▶   With single contract switching cost falls from 'k' to 0.

▶ With two contracts:
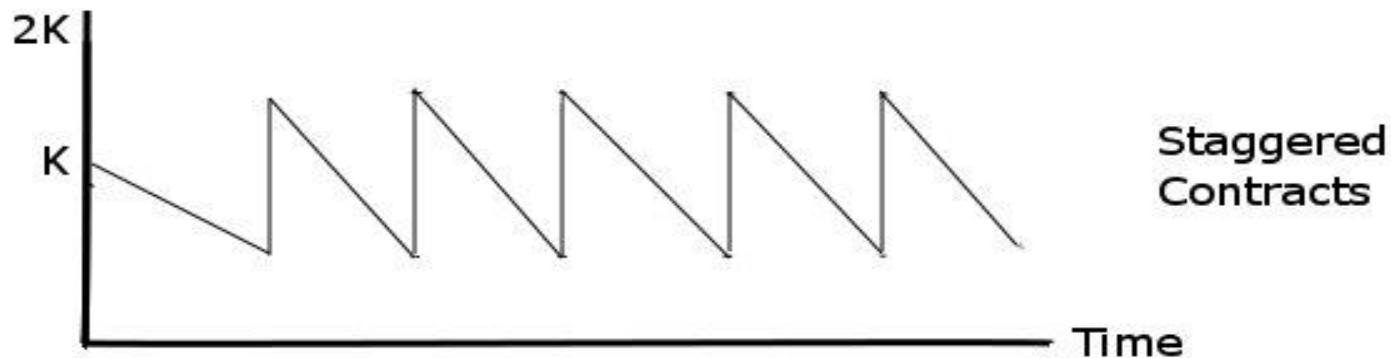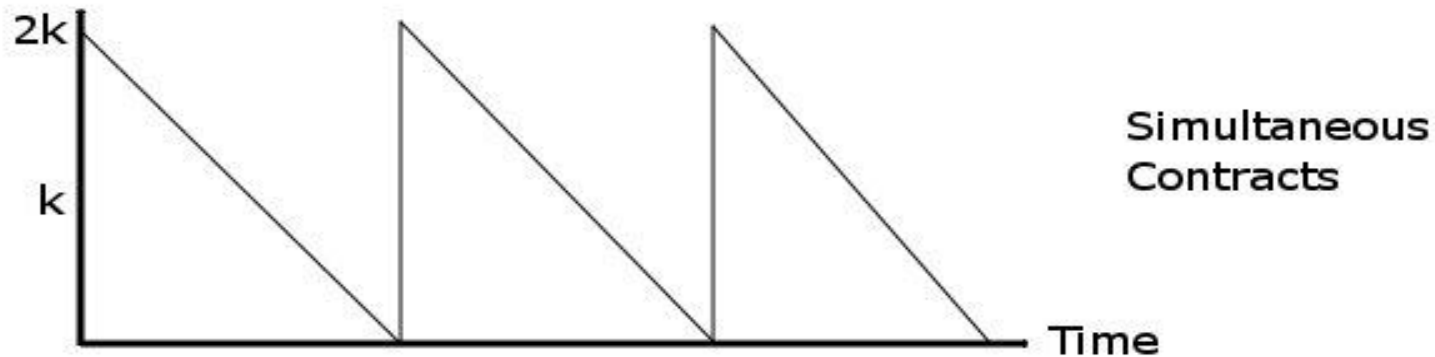
Leveraging Installed Base I: Pricing

▸ Two firms (not competitive market, as before)

   ▸ Some consumers locked-in, others are free.

▸ Lowering price…

   ▸ reduces profits from loyal customers.

   ▸ increases profits from free agents.

   ▸ increases installed base and increases future profits.

▸ Expect switching costs to raise prices and profits

   ▸ Fattening effect: If A lowers price, then B's market share falls and B's prices falls, increasing competition.

   ▸ Skeptical consumer effect: if A lowers price expect A's market share to rise and A's future prices to rise, reducing elasticity.

Leveraging Installed Base II: General

▸ Have full range of products

   ▸ Means consumers can stay within brand (e.g. car range)

▸ Sell complementary products

   ▸ Increases lock-in (e.g. MS Office) and is money-spinner (e.g. ink)

▸ Early contract renewal

   ▸ Keep agent locked in (e.g. football contracts, phone contracts)

▸ Sell access to installed base

   ▸ Adverts (e.g. Google) or endorsement (e.g. AAA)

▸ Price discriminate between "free" and "loyal"

   ▸ Lower price to free (e.g. magazines). Version to reduce arbitrage.

   ▸ Higher price to free (e.g. software upgrades)

Leveraging Installed Base III: Entry

- Limit pricing
  - Build up market share to avoid entry.
- Creating switching costs
  - Benefits incumbents but harms entrants.
- Beware overestimating switching costs (and customer value)
  - New entrants try to reduce SC
  - Example: MS Word mimicked WordPerfect controls.
  - Example: can honor other firms loyalty points.

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