

# CPSC156: The Internet Co-Evolution of Technology and Society

Lecture 4: January 25, 2007  
Web-based Business

# The WWW Revolution

- Late 1990: WWW, HTTP, HTML, "Browser" invented by Tim Berners-Lee at CERN.
- Mid-1994: Mosaic Communications founded (later renamed to Netscape Communications).
- 1995: "Browsing" has become a universal pastime. IE ships with Windows 95.
- New businesses (*e.g.*, portal companies) enabled.
- Old businesses (*e.g.*, book selling) revolutionized.
- Triumph of Internet architecture and ethos: layering, "stupid network," open standards.

# Web Brought Us E-Commerce

Electronic commerce is a set of technologies, applications, and business processes that link business, consumers, and communities

- For buying, selling, and delivering products and services
- For integrating and optimizing processes within and between participant entities

# E-Commerce, cont.

- **Information** is anything that can be digitized, *i.e.*, encoded as bits. Examples include books, magazines, movies, music, web pages, software, and databases.
- **Information industries** are those that produce information goods and/or deliver information services.
- **Networked industries** are those that rely on customers' interaction. Networks can be real (as in the telecomm industry) or virtual (as in the PC-software industry).

# The Internet is "an Interesting and Productive Forum" for Business

- Netscape
- Napster
- LimeWire
- KaZaa
- Amazon
- bn.com  
(Barnes & Noble)
- VeriSign
- ? Covisint
- eBay
- Google
- Yahoo
- AOL
- MSN (Microsoft)

# The Internet is *Not* a Miraculous Forum for Business

In CPSC155 (Spr '01), but **not** in CPSC156 (Fall '03): Intertrust, Exodus, Ariba, OpenMarket, Pets.com,... In for **historical** interest: Netscape and Napster

"The Internet Boom": c. 1997 - c. 2001 (now called "first boom")

# Existing Business Models for Information Products

- **Fee models:** Subscription purchase, Single-transaction purchase, Single-transaction license, Serial-transaction license, Site license, Payment per electronic use
- **Advertising models:** Combined subscription and advertising income, Advertising income only
- **"Free" distribution models:** Free distribution (no hidden motives), Free samples (e.g., coming attractions), Free first version, Free information when you buy something else (complementary products, bundling)

# Less Traditional Business Models for Information Products

- **Extreme customization**: Make the product so personal that few people other than the purchaser would want it.
- Provide a **large product in small pieces**, making it easy to browse but difficult to get in its entirety.
- **Give away digital content** because it **complements** (and increases demand for) the traditional product.
- Give away the product, **sell the service contract**.
- Allow free distribution of the product but **request payment** (Shareware).
- Position the product for **low-priced, mass market distribution**.



# Network Effects

- A product or service exhibits **network effects** if its value to any single user is strongly positively correlated with the total number of users. Communication products and services are prime examples.
- Network-effected products and services exhibit **long lead times** followed by **explosive growth**. Example: Fax invented in 1843, offered by AT&T in 1925, and widely adopted in 1980s.
- "Network-effected"  $\neq$  "mass-market"
- \* Network effects cut both ways!

# Lock-in and Switching Costs

- Information industries often involve **systems of interoperating components** and **durable complementary assets**. Prime examples are Intel processors, Windows PC Platform, and numerous PC application programs.
- Often leads to **technology lock-in** and **high switching costs**
- Modular architectures and open standards are mitigating forces.
- "Network effects"  $\neq$  "Strong lock-in"
- "High market share"  $\neq$  "High switching costs"

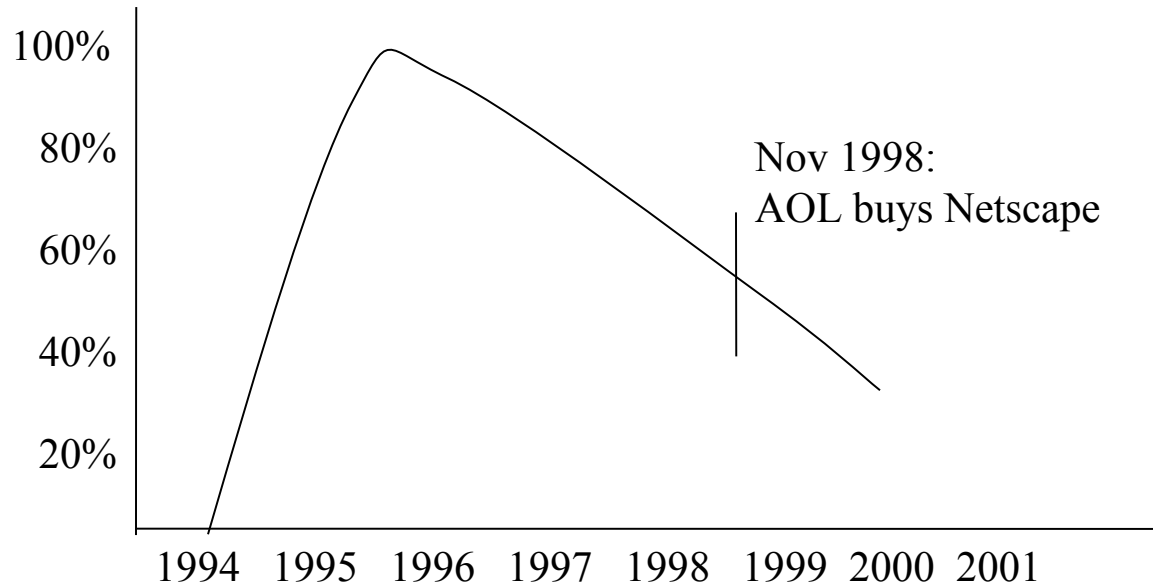
# Discussion Points

- Have *you* been forced by network effects and systems effects to pay high switching costs?
- Do information industries have too much power over consumers?
- Note failed attempts to force switching: Quadraphonic sound, (Landline) Picture Phones, DAT, "Trusted Systems," ...
- Note current attempt: HD DVD formats

# Textbook Case: Netscape

- **Late 1990:** WWW, HTTP, HTML, "Browser" invented by Tim Berners-Lee
- **Mid-1994:** Mosaic Communications founded (later renamed to Netscape Communications)
- **Summer of 1995:** Market share 80%+
- **August 1995:** Windows 95 released with Internet Explorer
- **January 1998:** Netscape announced that its browser would thereafter be **free**; the development of the browser would move to an **open-source** process.

# Estimated Market Share of Netscape



NOTE: data are from different sources and not exact

# Perfectly Captures the *Essence* of the First Boom

- Enormous power of Internet architecture and ethos (e.g., layering, "stupid network," open standards)
- Must bring new technology to market quickly to build market share
- Internet *is* the distribution channel.
  - First via FTP, then via HTTP (using Netscape!)
  - Downloadable version available free and CD version sold

# Uses Many "Information Business Models"

(esp. those that involve making money by "giving away" an information product)

Complementary products (esp. server code)

- Bundling
  - Communicator includes browser, email tool, collaboration tool, calendar and scheduling tool, *etc.* One "learning curve," integration, compatibility, *etc.*
- Usage monitoring
  - Data mining, strategic alliances
  - "Installed base"  $\neq$  "Active installed base"

# Browser as "Soul of the Internet"

- "New layer" (Note Internet architectural triumph!)
- Portal business
  - Early "electronic marketplace"
  - Necessity of strategic alliances
  - "Positive transfers" to customers
- (Temporarily?) Killed R&D efforts in user interfaces



# Pluses and Minuses of Network Effects

- + Initial "Metcalfe's Law"- based boom
- + Initial boom accelerated by bundling, complementary products, etc.
- Network effects  $\neq$  strong lock in  
high market share  $\neq$  high switching costs
- Network effects are strong for "browser"  
but weak for any particular browser.

# Terminology

- **B2C Commerce**: Interactions relating to the purchase and sale of goods and services between a business and consumer—retail transactions.
- “Novelty” is that retail transaction is done on the Internet, rather than in a “brick and mortar” store location.
  - All the customer needs is a browser!
- Technical evolution of B2C from “brick and mortar” model not new.

# A Different Approach to Location Retailing

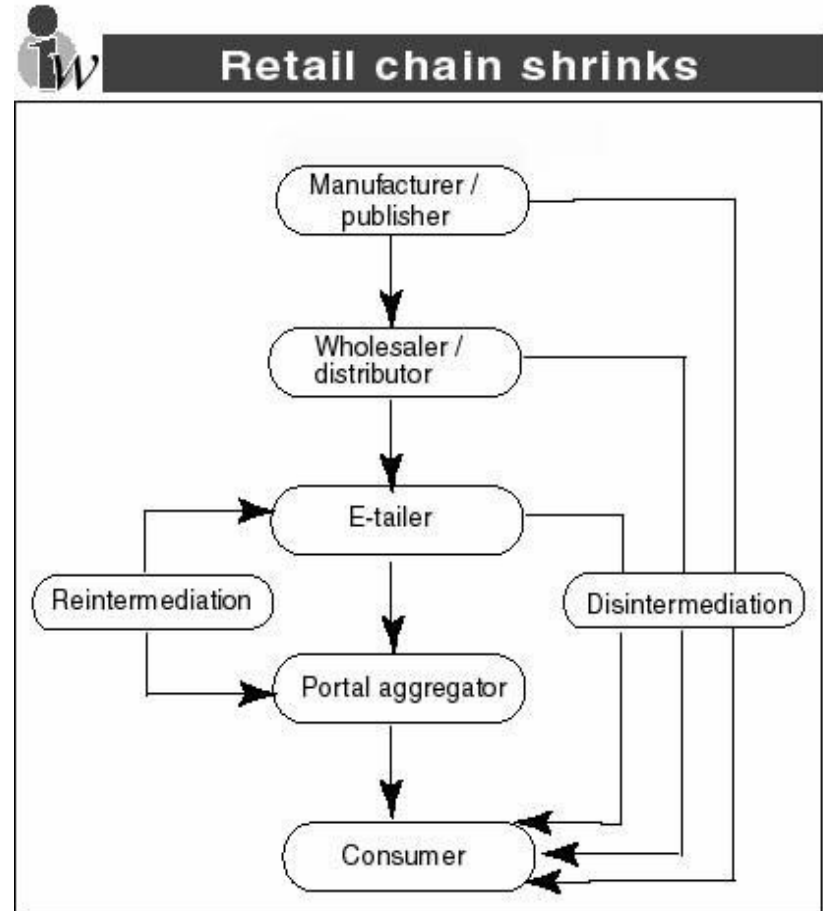
- In 1886, a jeweler unhappy with a shipment of watches refuses to accept them.
- A local telegraphy operator buys the unwanted shipment.
- He **uses the telegraph to sell** all the watches to fellow operators and railroad employees.
- Becomes so successful that he quits his job and started his own enterprise, **specializing in catalog sales**.
- Name: **Richard Sears** of Sears Roebuck

# B2C Revenue Models

- Sell goods and services and take a cut (just like B&M retailers).  
(e.g., Amazon, E\*Trade, Dell)
- Advertising
  - Ads only (original Yahoo)
  - Ads in combination with other sources
- Transaction fees
- Sell digital content through subscription.  
(e.g., WSJ online, Economist Intelligence Wire)

# First-Generation B2C

- Main Attraction:  
**Lower Retail Prices**
- "B2C Pure Plays" could **eliminate intermediaries**, storefront costs, some distribution costs, *etc.*
- Archetype:  
[www.amazon.com](http://www.amazon.com)



Source: Benchmark Capital Group ; The Economist

# Many Failed B2C Pure Plays

eToys.com, pets.com, webvan.com,...

See <http://disobey.com/ghostsites>.

"Here's a radical thought: The future of the online grocer market belongs to grocery stores. They know the business, they can mix (sales) channels, and they can take their time."

W. Andrews (Gartner), 7/9/01,  
commenting on the webvan.com  
bankruptcy.

# "Multi-Channel" Retail (B2C w/ B&M)

- Exploit multiple marketing and distribution channels simultaneously
  - B&M ("bricks and mortar") stores: Customers browse on the web before going to the store.
  - Catalog sales, telephone, tv advertising,...
- Since 2002, multi-channel retailers (*i.e.*, B&Ms or traditional catalog companies that also sell online) have accounted for most of B2C e-commerce. Originally, they focused mostly on high-margin sales, *e.g.*, computers, travel, and automotive.
- Multi-channel retailers are more profitable, on average, than web-based and store-based retailers.

(source: Boston Consulting Group)

# Advantages of Multi-Channel Retail

- Leverage existing brands.
- Biggest B&M retailers have huge clout. (Walmart's annual sales are still much larger than all e-tailers' combined.)
- Profits from existing channels can subsidize e-tail start-up. No need to quit when VCs lose interest.
- Use established distribution and fulfillment infrastructure (e.g., LL Bean, Land's End, ...).
- Cross-marketing and cross-datamining.