

# **The Economics of E-commerce and Technology**

The Nature of Information Goods

# Information Goods

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- ▶ **Take broad view of an information good**
  - ▶ Anything that can be digitized (or has a digital component)
  - ▶ Books, databases, movies, stock quotes etc.
  
- ▶ **What is special?**
  - ▶ Reproducibility
  - ▶ Degree of variety
  - ▶ Customizability
  - ▶ Search and attention

# Reproducibility

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- ▶ **Information goods are...**
  - ▶ Costly to produce but cheap to reproduce.
  - ▶ That is, high fixed costs but low (zero) marginal costs.
  - ▶ No capacity limits
- ▶ **Examples**
  - ▶ Cable companies – cost to lay lines.
  - ▶ Microsoft office – cost to design program
  - ▶ Amazon – cost to build warehouses and buy inventories
- ▶ **Platforms/networks not unique to the online economy**
  - ▶ Shopping malls are platforms
  - ▶ Postal system is a network
  - ▶ What is new is the scale: one mall for the entire world.

# Example: CD Phone Books

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- ▶ **CD Phone Books are digitized versions of Yellow Pages**
  - ▶ Nynex covered NYC in 1986. Charged \$10,000 per disk.
  - ▶ Pro CD covered entire USA. Charged \$hundreds in early '90s
- ▶ **Lots of entry ensued**
  - ▶ Over 20 companies by end of 1990s.
  - ▶ Cost of disk is \$20.
- ▶ **Product is commodity and no capacity constraints**
  - ▶ If firm A charges \$200.
  - ▶ Then B should charge \$190 and steal all market.
  - ▶ Then A should charge \$180 etc.
  - ▶ Prices go down to marginal costs.

# Two Business Models

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- ▶ There are two ways firms can make money when selling information goods
- ▶ Differentiate the product
  - ▶ Sell something different from other firms
  - ▶ Firm has some market power and can recover fixed costs
- ▶ Be a dominant firm
  - ▶ Be the only firm in the industry
  - ▶ Have the lowest costs.
  - ▶ Have the first-mover advantage.

# Differentiation

# Dimensions of Differentiation

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- ▶ Delay (e.g. cinema vs. DVDs, Netflix vs. Blockbuster)
- ▶ User interface (e.g. Google vs. Yahoo)
- ▶ Customizability (e.g. Facebook's privacy settings)
- ▶ Resolution (e.g. different qualities of MP3s)
- ▶ Speed of operation (e.g. printers)
- ▶ Flexibility of use (e.g. protected MP3s)
- ▶ Unique features (e.g. Charles Schwab)
- ▶ Comprehensiveness (e.g. Mathematica)
- ▶ Annoyance (e.g. Network TV vs PBS)
- ▶ Support (e.g. McAfee)
- ▶ Online vs. Offline (e.g. newspapers)
- ▶ Fashion image (e.g. Apple)
- ▶ Reliability (e.g. Toyota)

# Longtail

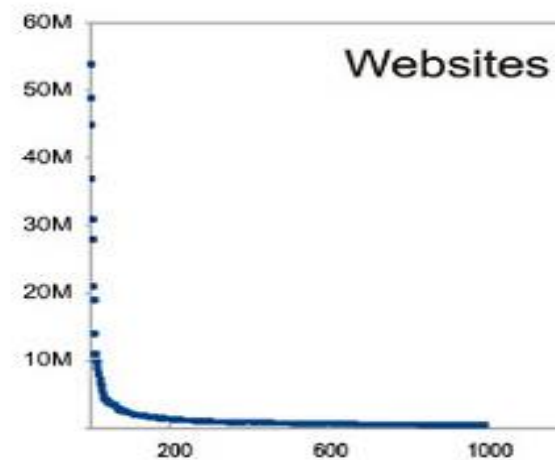
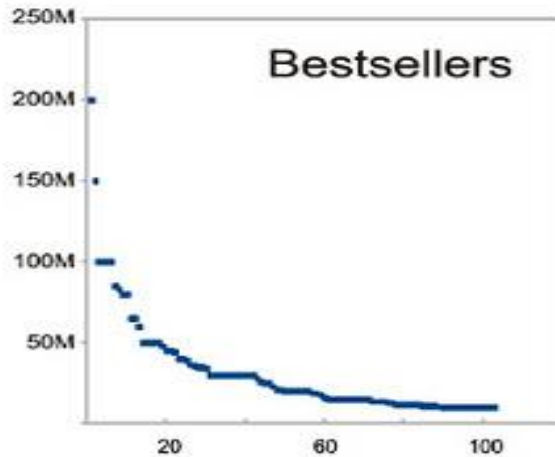
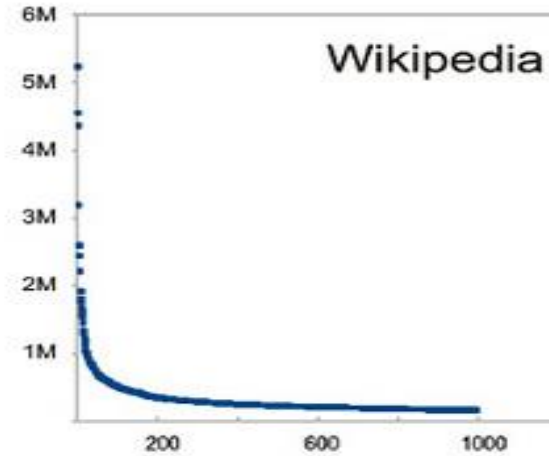
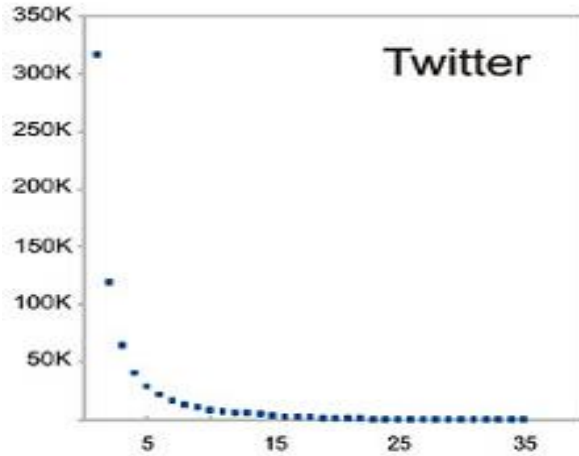
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- ▶ **There is huge variety of many products**
  - ▶ Books, Songs, Movies, iPhone Apps, Games etc.
  - ▶ Both horizontally and vertically differentiated
- ▶ **Distribution of demand follows power law**
  - ▶ Frequency approximately inversely proportional to rank.
  - ▶ Seen with words in English:  $\Pr(r)=0.1/r$ , where  $r$  is rank.
  - ▶ Distribution has fat tail, where there is lots of mass.
- ▶ **Niche products matter**
  - ▶ Typical bookstore has 130,000 titles.
  - ▶ One third of Amazon's sales come from outside top 130,000.
- ▶ **Sorting information**
  - ▶ With more information, need better organization and filtering.



# Power laws...

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# Squeezing the Middle

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## ▶ **Movie industry**

- ▶ Number of American movies growing (610 in 2009; 471 in '99)
- ▶ Blockbusters growing bigger (32 movies over \$100m; 21 in '99)

## ▶ **Music sales**

- ▶ Album sales declined 20% since 2004.
- ▶ Hits hold up best; Albums ranked 300-400 hold up worst.

## ▶ **Fragmentation**

- ▶ Due to long tail and falling costs of production and distribution.

## ▶ **Consolidation**

- ▶ People want to share same culture (e.g. Terminator).
- ▶ New technology helps distribution and communication.
- ▶ Increased role of brands (e.g. NY Times)

# Dominant Firm

# First-Mover Advantage

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- ▶ First firm may deter future entry. Strategies:
- ▶ Build capacity to respond to a threat
  - ▶ Build base of loyal (locked in) customers.
  - ▶ Build network.
  - ▶ Have more capacity than you need.
- ▶ Limit-entry pricing
  - ▶ Price low in order to prevent entry.
  - ▶ Signals you are “tough” and builds customer base.
  - ▶ Example: Airlines before Southwest enters.
- ▶ After entry, play tough.
  - ▶ This may scare off first entrant.
  - ▶ Give you a reputation and prevent future entry.
  - ▶ Example: Walmart and Unions.

# Cost or Benefit Leadership

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- ▶ **Average costs made up of**
  - ▶ Marginal costs (may be already low with information good)
  - ▶ Per-period fixed cost (e.g. cost of upgrading software)
- ▶ **How to reduce average costs**
  - ▶ Build volume to amortize fixed costs.
  - ▶ Build volume to benefit from learning-by-doing.
  - ▶ Supply chain management: reduce distribution costs.
- ▶ **How to raise benefits**
  - ▶ Invest in superior technology
  - ▶ Improved customer service
  - ▶ High brand equity

# Other Aspects of Information Goods

# Product Customization

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- ▶ **Online firms have lots of information on customers.**
  - ▶ Demographics: IP address, registration
  - ▶ Observation: cookies monitor clickstream (pages visited and for how long), past purchases, partnerships with other sites.
- ▶ **Use this information to customize experience**
  - ▶ Search results.
  - ▶ Product recommendations.
  - ▶ Targeted advertising.
  - ▶ Facebook friend finder.
- ▶ **Data is the oil of the 21<sup>st</sup> century.**


# Google Analytics




## Site Usage

 **6,212 Visits**


Previous: 5,112 (21.52%)

 **64.42% Bounce Rate**

Previous: 66.12% (-2.56%)

 **9,822 Pageviews**

Previous: 7,934 (23.80%)

 **00:03:04 Avg. Time on Site**

Previous: 00:02:12 (39.45%)

 **1.58 Pages/Visit**

Previous: 1.55 (1.87%)

 **68.67% % New Visits**

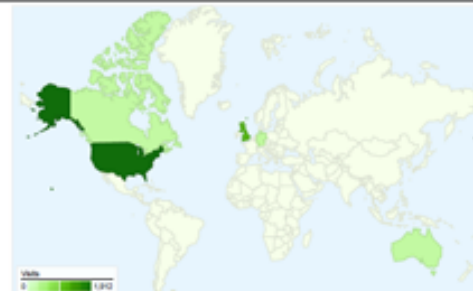
Previous: 74.04% (-7.25%)

## Visitors Overview



**Visitors**  
**4,707**

## Map Overlay





# Content Creation

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- ▶ **Users also design own experience**
  - ▶ WordPress – people to create blogs.
  - ▶ Craigslist – online classified.
  - ▶ Google Wave – real time team projects.
- ▶ **Crowdsourcing**
  - ▶ Wikipedia allows users to create own encyclopedia.
  - ▶ Ushahidi provides crisis information.
  - ▶ Open source software design.
- ▶ **Business model**
  - ▶ Provide toolkit for people to build product.
  - ▶ Provide structure for interaction between people.

# Reproducibility and Property Rights

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- ▶ Information is a public good (i.e. it is nonrivalrous)
  - ▶ With traditional goods there is physical cost of reproduction.
- ▶ Excluding people from information
  - ▶ Reduces consumption and welfare
  - ▶ Gives rents to seller, encouraging innovation
  - ▶ May lower subsequent innovation
- ▶ How to exclude
  - ▶ Intellectual property: patents, copyright, trademarks.
  - ▶ Trades secrets.
- ▶ Hard to enforce with online economy
  - ▶ Perfectly reproduce and instantly transmit around the world.
  - ▶ Information regarding how to break protection also free.
- ▶ Are some firms too worried? Cassette player. Video recorder.

# Experimentation and Adaptation

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## ▶ Traditional industries

- ▶ Changing product is rare occurrence (e.g. car models).
- ▶ Hard to gauge reaction (surveys, focus groups).

## ▶ Experimentation online

- ▶ Easy to run controlled experiments.
- ▶ Refine pricing, matching algorithms, recommendations etc.

## ▶ Adaptation

- ▶ When the state of the world changes, firm can react quickly.
- ▶ Also react to competitors (e.g. first-price ad auctions).

# Experimentation...

Google used gibson les paul

Go to Google Home  
Web Images Maps Shopping More Search tools






About 5,210,000 results (0.35 seconds)

Ads related to **used gibson les paul**

**Used Guitar - Used Gear in Like New Condition.**  
www.guitarcenter.com/  
★★★★★ 12,869 reviews for guitarcenter.com  
Free Shipping on 1000's of Items!  
2,700 people +1'd or follow Guitar Center  
\$10 Off \$49 or \$200 Off \$999+ Free Shipping to Stores  
Special February Financing Locations

**Gibson Les Paul Used on eBay - eBay.com**  
www.ebay.com/ - ★★★★★ 470 seller reviews  
Find **Gibson Les Paul Used** for less. eBay - It's where you go to save.

Shop for **used gibson les paul** on Google Sponsored

 <b>Gibson Les Paul Standard</b> \$1799.00 Guitar Center	 <b>Used Gibson Les Paul Studio</b> \$2169.20 Musicians...	 <b>Used Gibson Les Paul Studio</b> \$1099.99 eBay	 <b>Gibson Les Paul Studio</b> \$649.99 Buya	 <b>Gibson 2013 Les Paul Studio</b> \$2999.00 zZounds
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Shop by number of strings: [6-string](#) [12-string](#)

**Gibson | Dave's Guitar Shop**  
davesguitar.com/gibson/used/electric-guitar  
25+ items - Welcome to our **Gibson Guitars** landing page. Dave's Guitar ...  
8.6 pounds! \$2,995.00 **Gibson '58 Reissue Les Paul** Figured Top '12 Ice Tea ...  
9.4 pounds! \$2,250.00 **Gibson Les Paul** Custom Maduro '12

**Gibson Guitar - Get great deals for Gibson Guitar on eBay!**  
popular.ebay.com > Popular Items > Musical Instruments  
1968 Vintage **Gibson Les Paul** Standard Gold Top all original. 1 bid. US \$5,000.00 ...  
2008 **Gibson Les Paul** Studio Faded Mahogany Brown USA Electric Guitar. 7 bids ....  
**Used.** to \$. Clear Preferences. Buying formats. Auction. Buy It Now ...

**Gibson Les Paul - eBay - Find Popular Products on eBay!**  
popular.ebay.com > Popular Items > Musical Instruments  
Manufactured by Gibson, the Gibson Les Paul is one of the most widely known electric guitars. ... **USED Gibson Les Paul** LP Traditional Plus Top Iced Tea ...

Ads

**New: Used Les Paul Gibson**  
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Save Big On **Used Les Paul Gibson** Guitars:  
Massive Selection & Ultra-Cheap!

**Used Les Paul at Amazon**  
www.amazon.com/instruments  
★★★★★ 1,200 seller reviews  
Sound Values on Instruments & Gear  
Over 10,000 Instruments

**Used Gibson Les Paul**  
www.nextag.com/  
Deals - **Used Gibson Les Paul.**  
See NexTag Sellers' Lowest Price!

**Gibson Les Paul Used Sale**  
gibson-les-paul-used.compare99.com/  
Up To 70% Off **Gibson Les Paul Used**  
**Gibson Les Paul Used.** Compare

**Used Gibson Guitars**  
www.williesguitars.com/  
Vintage **Les Paul**, 335, SG, Guitar  
Best Prices Fast Shipping & Service

**Win Gibson Les Paul**  
bluesmasters.yoov.io  
Win **Gibson Les Paul** Guitar  
View or Enter Blues Contest

**Gibson Les Paul Used**  
www.webcrawler.com/  
Search multiple engines for  
**gibson les paul used**

See your ad here >

Google macys

Web Images Maps Shopping News More Search tools

About 77,700,000 results (0.29 seconds)

Ad related to **macys**

**Macys.com - Macy's - Official Site**  
www.macys.com/  
★★★★★ 69 reviews for macys.com  
Save on the Hottest Fashion - Free Shipping w/ \$99 Order Today!  
» Map of 2801 Stevens Creek Blvd. and nearby **macys.com** locations  
132,644 people +1'd or follow Macy's

Wedding Registry	Go Red for Women
Gift Cards	Black History Month
Free 7-Pc. Gift w/ Lancome Purchase	Become a Facebook Fan

**Macy's - Shop Fashion Clothing & Accessories - Official Site - Macys ...**  
www.macys.com/  
**Macy's** - FREE Shipping at **Macys.com**. **Macy's** has the latest fashion brands on Women's and Men's Clothing, Accessories, Jewelry, Beauty, Shoes and Home ...

**Eastridge**  
Macy's Eastridge. Directions | Catalogs. 2210 Tully Road ...

**Home Store**  
Furniture - Kitchen - Home Decor - Sale & Clearance - Mattresses

**Macy's Wedding Registry**  
Macy's Wedding Registry- Create, modify or search a bridal ...

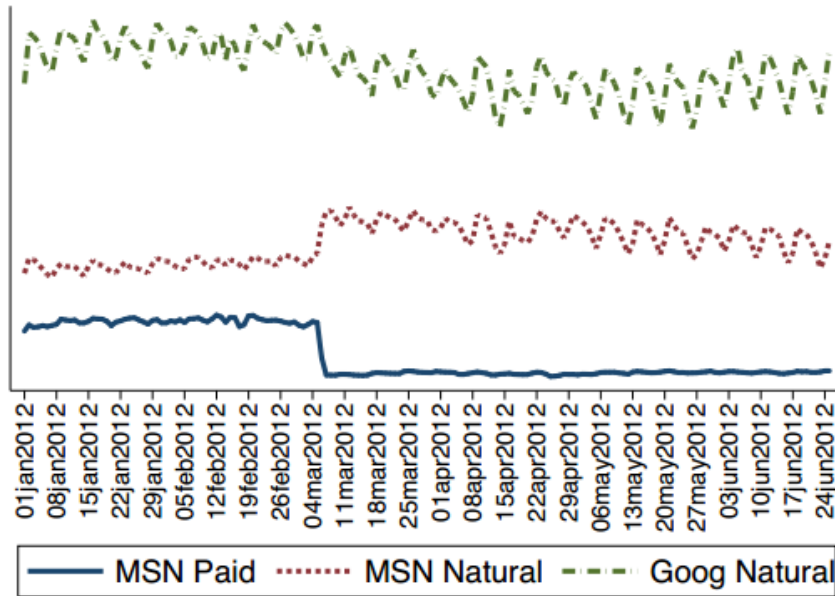
**Shoes**  
Women's Shoes - Pumps - Womens Sandals - Flats - ...

**Women's Clothing, Clothes**  
Shop Women's Clothing at Macy's. Macy's.com carries clothing for ...

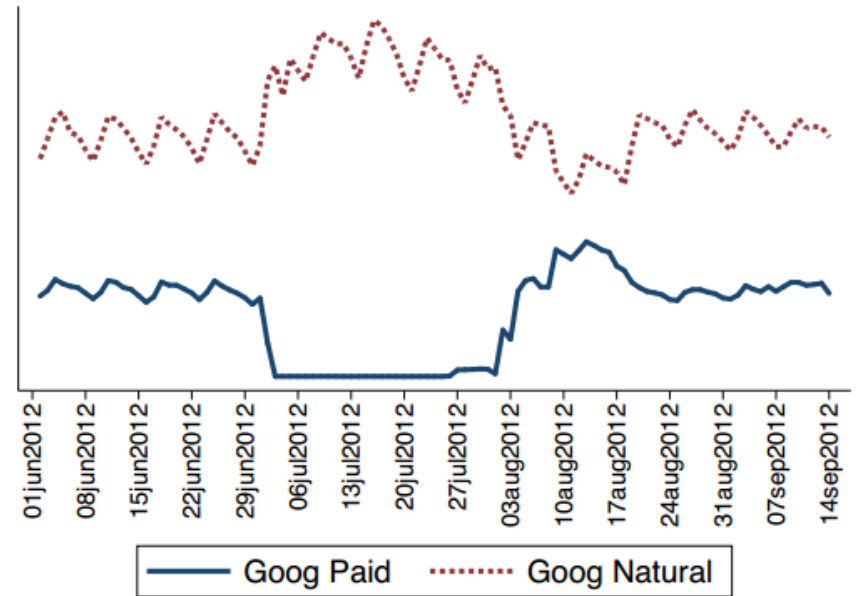
**Men's**  
Browse our selection of Men's Clothing and the latest trends in ...

More results from macys.com >

Figure 2: Brand Keyword Click Substitution

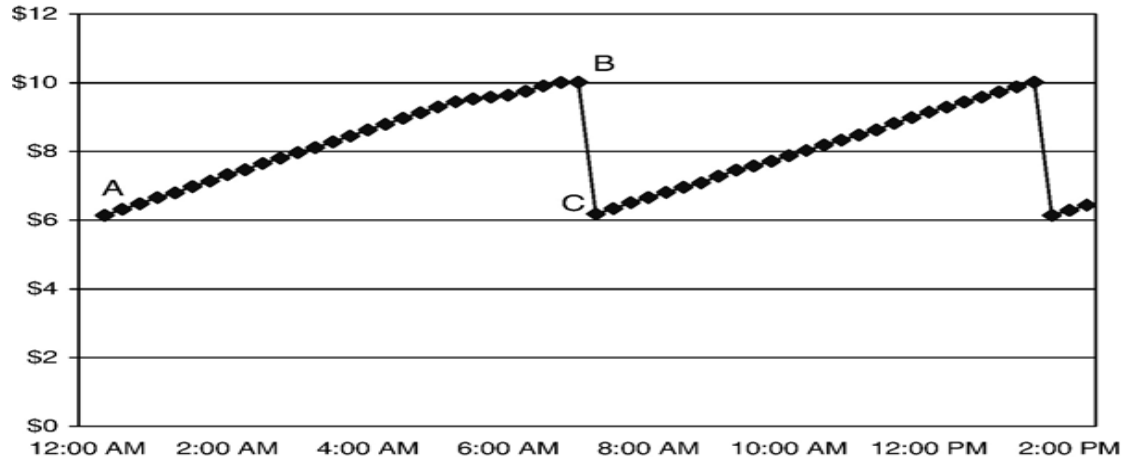


(a) MSN Test

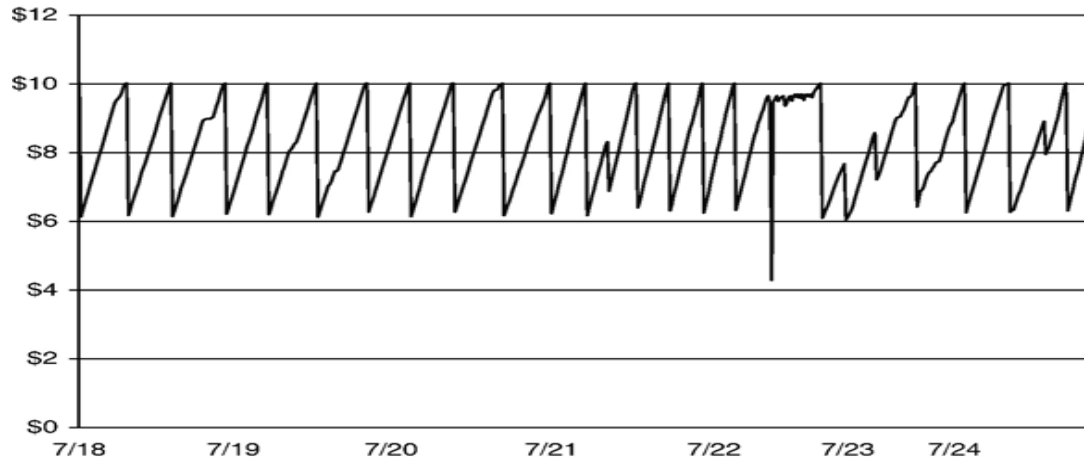


(b) Google Test

# Adaptation in AdWords Auctions



(a) 14 hours



(b) 1 week

# Adaptation (gone wrong)



simon's Amazon.com | Today's Deals | Gift Cards | Help

The All-New  
kindle fire HD



Shop by  
Department ▾

Search

Books ▾

Go

Hello, **simon**  
Your Account ▾

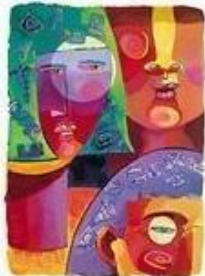
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Cart ▾

Wish  
List ▾

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**PSYCHOLOGY**  
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# Platforms and Market Design

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- ▶ **Platforms control many aspects of exchange**
  - ▶ Online firms have lots of information about customers.
  - ▶ They can also control what participants know about the product, the market and each others.
- ▶ **Examples**
  - ▶ Letting participant monitor each other (e.g. Yelp).
  - ▶ Reputation mechanisms (e.g. eBay).
  - ▶ Anonomizing interactions (e.g. Hotwire).
  - ▶ Market rules (e.g. Google ad auctions).
  - ▶ Structuring search (e.g. Facebook).
  - ▶ How people see prices (e.g. Bing travel).



# Product trials

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- ▶ **Experience good:** The quality is known after consumption.
  - ▶ What is today's NY Times worth?
  - ▶ How good is this iPhone app?
  - ▶ All information is experience good!
- ▶ **Strategies**
  - ▶ Reveal parts of information (e.g. free song, Amazon's "look inside")
  - ▶ Given temporary access to information (e.g. put on Hulu)
  - ▶ Promotional pricing (e.g. low prices for new subscribers)
  - ▶ Building a brand/reputation (e.g. NY Times)
  - ▶ Testimonials (e.g. Trip Advisor)
  - ▶ Influential reviewers (e.g. movies)
  - ▶ Free, trial version (e.g. Salon.com)

# Attention and Search

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- ▶ **The internet promises to lower search costs**
  - ▶ Easy to visit many stores.
  - ▶ Price comparison websites.
- ▶ **Danger of information overload**
  - ▶ Increase in number and types of sites.
  - ▶ Increase in products at a given site.
- ▶ **Important to “organize the world’s information”**
  - ▶ Locating, filtering and communicating what is useful.
- ▶ **Examples**
  - ▶ Yahoo vs. Google news.
  - ▶ Advertising - banner ads vs. search ads.
  - ▶ Value of website addresses (most expensive: insure for \$16m)