

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

The Nature of Technology Industries

# Technology Firms are Different

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- ▶ Main ideas so far can be applied to any firm
  - ▶ Porter's five forces
  - ▶ Competitive advantage
  
- ▶ Technology firms are different
  - ▶ Reproducibility
  - ▶ Degree of variety
  - ▶ Customizability
  - ▶ Adaption
  - ▶ Experimentation

# 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 of building network of warehouses
- ▶ **The economics is the same as in the offline world**
  - ▶ But scale is different (shopping mall vs eBay)
  - ▶ Speed is different (Electricity standard vs Blu-Ray standard)

# How Not to Make Money: 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 vs MySpace)
- ▶ Resolution (e.g. 4k, HD, Regular movies)
- ▶ Speed of operation (e.g. HP printers)
- ▶ Flexibility of use (e.g. protected MP3s)
- ▶ Comprehensiveness (e.g. Mathematica)
- ▶ Annoyance (e.g. Netflix vs Network TV)
- ▶ Customer service (e.g. Zappos vs Walmart)
- ▶ Fashion image (e.g. Apple vs Dell)
- ▶ Reliability (e.g. Toyota vs Jeep)

# Longtail

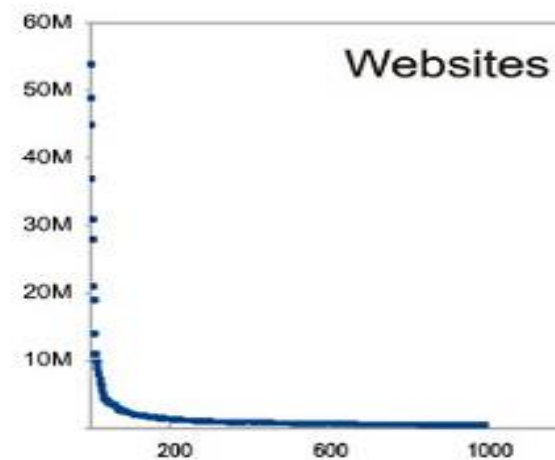
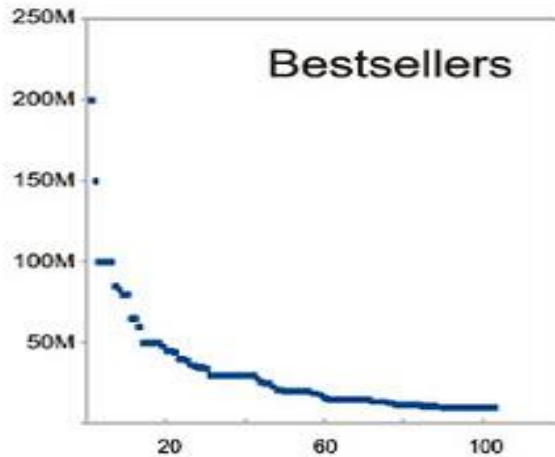
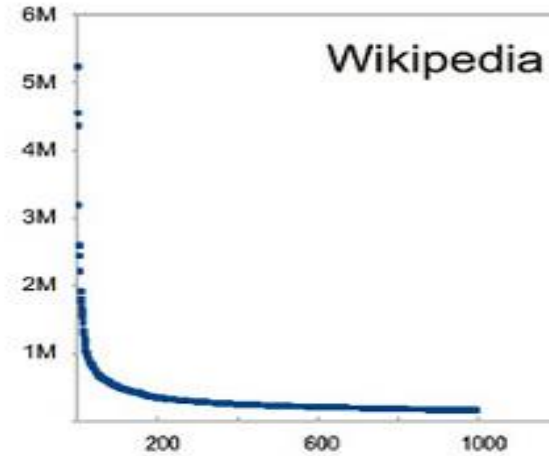
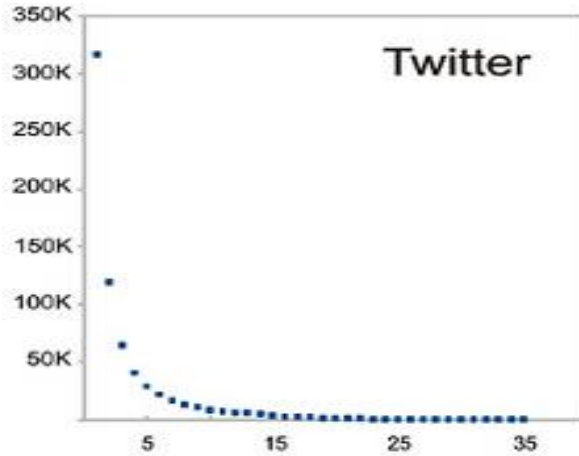
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- ▶ **There is huge variety of many products**
  - ▶ Books, Songs, Movies, iPhone Apps, Games etc.
  - ▶ Both horizontally and vertically differentiated
- ▶ **Distribution of demand follows power law**
  - ▶ Frequency approximately inversely proportional 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

# 1. 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**
  - ▶ Targeted advertising.
  - ▶ Search results.
  - ▶ Product recommendations.
  - ▶ Facebook friend finder.
- ▶ **Data is the oil of the 21<sup>st</sup> century.**

# Google Analytics

g Customization Admin

My Homepage - <http://www.econ.ucla.edu>  
All Web Site Data

## Overview

Aug 23, 2015 - 3

Add to Dashboard Shortcut

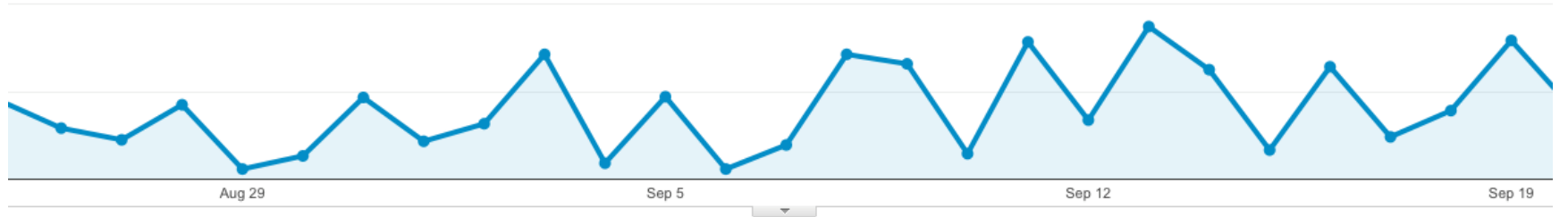
Segments

+ Add Segment

Comparison vs. Select a metric

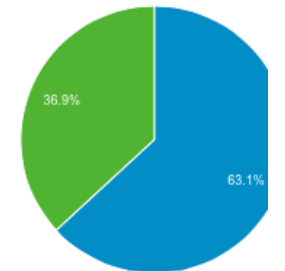
Hourly

Avg. Session Duration



 Users <b>529</b>	 Pageviews <b>1,715</b>	 Pages / Session <b>2.36</b>	 Avg. Session Duration <b>00:01:35</b>
 % New Sessions <b>63.14%</b>			

■ New Visitor ■ Returning Visitor



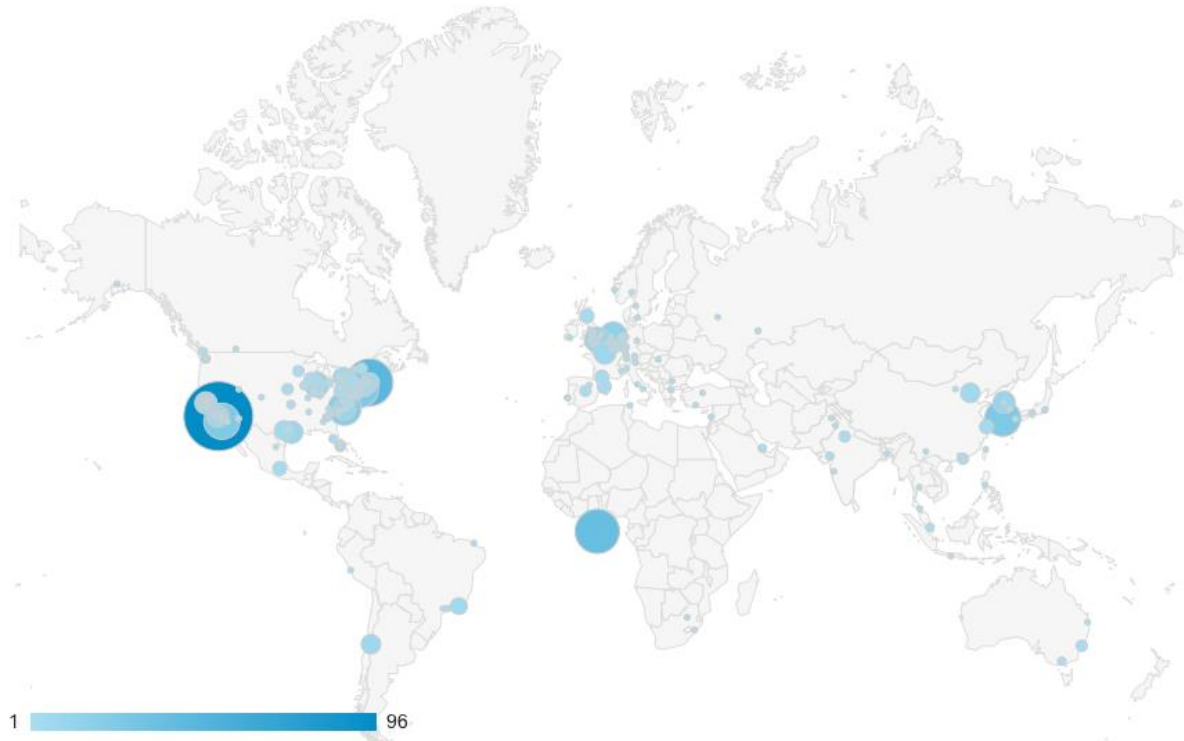


# Geographic Distribution

Map Overlay Explorer

Summary Site Usage Ecommerce

Sessions ▾



# Behavior

## Behavior Flow

Automatically Grouped Pages ▾ Level of Detail ▾ Export ▾

All Sessions  
100.00%

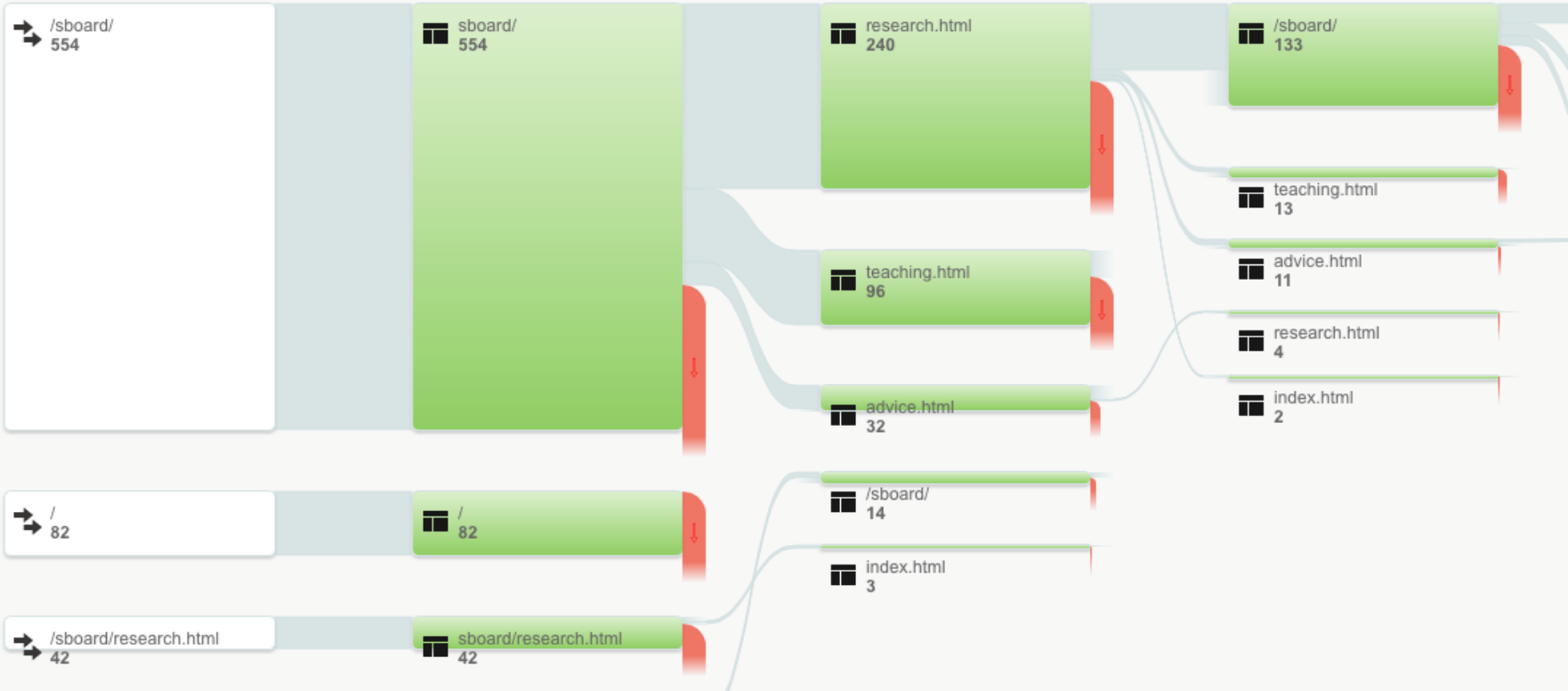
+ Add Segment

Landing Page ▾ ⚙

Starting pages  
716 sessions, 331 drop-offs

1st Interaction ✕  
385 sessions, 222 drop-offs

2nd Interaction ✕  
163 sessions, 96 drop-offs



## 2. Content Creation

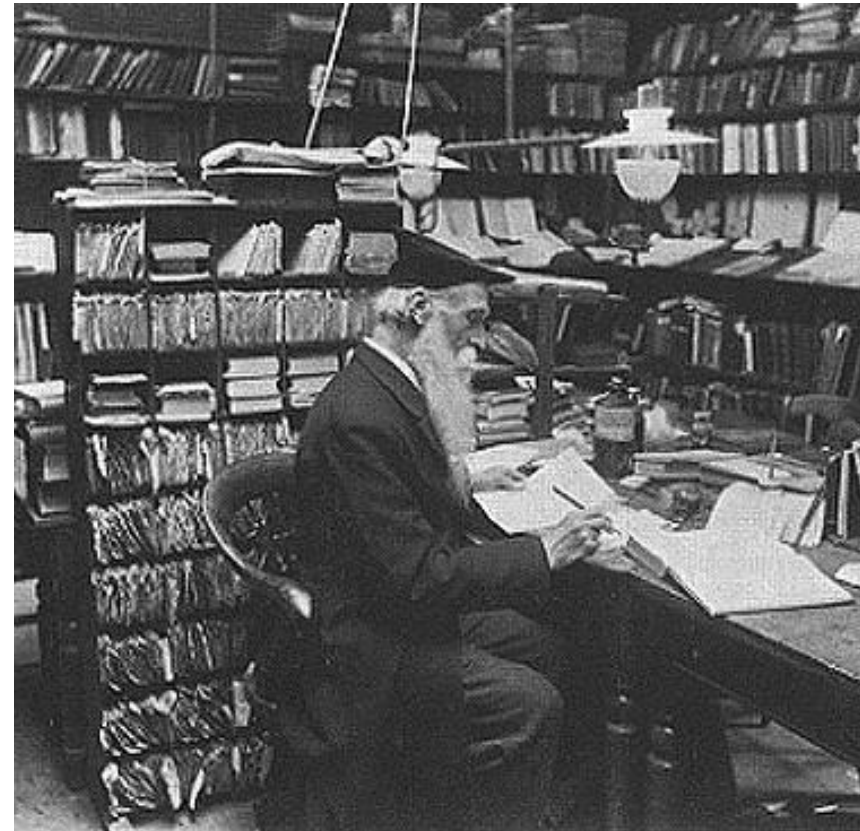
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- ▶ **Users also design own experience**
  - ▶ WordPress – people to create blogs.
  - ▶ Craigslist – online classified.
  - ▶ Vine – six-second videos.
- ▶ **Crowdsourcing**
  - ▶ Wikipedia allows users to create own encyclopedia.
  - ▶ Ushahidi provides crisis information.
  - ▶ Kickstarter crowd-funds projects.
  - ▶ Open source software design.
- ▶ **Business model**
  - ▶ Provide toolkit for people to build product.
  - ▶ Provide structure for interaction between people.

# How we used to do this...The OED

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- ▶ **Started 1857**
  - ▶ 'A' published in 1888
  - ▶ 'Z' published in 1928
  - ▶ 22,000 pages
- ▶ **Big data**
  - ▶ Hundreds of volunteers
  - ▶ 3.5m quotation slips
  - ▶ Scriptorium had 1,029 pigeon holes



# 3. 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.
  - ▶ Trade 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.

# 4. 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

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/](http://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/](http://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



Gibson Les Paul Standard...

\$1799.00

Guitar Center



Used Gibson Les Paul Sta...

\$2159.20

Musicians...



Used Gibson Les Paul Stu...

\$1099.99

eBay



Gibson Les Paul Studio

\$649.99

Buya



Gibson 2013 Les Paul Sta...

\$2999.00

zZounds

Shop by number of strings: [6-string](#) [12-string](#)

### Gibson | Dave's Guitar Shop

[davesguitar.com/gibson/used/electric-guitar](http://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](http://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](http://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

[used-les-paul-gibson.buycheapr.com/](http://used-les-paul-gibson.buycheapr.com/)

Save Big On **Used Les Paul Gibson** Guitars:

Massive Selection & Ultra-Cheap!

### Used Les Paul at Amazon

[www.amazon.com/instruments](http://www.amazon.com/instruments)

★★★★★ 1,200 seller reviews

Sound Values on Instruments & Gear

Over 10,000 Instruments

### Used Gibson Les Paul

[www.nextag.com/](http://www.nextag.com/)

Deals - **Used Gibson Les Paul.**

See NexTag Sellers' Lowest Price!

### Gibson Les Paul Used Sale

[gibson-les-paul-used.compare99.com/](http://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/](http://www.williesguitars.com/)

Vintage **Les Paul**, 335, SG, Guitar

Best Prices Fast Shipping & Service

### Win Gibson Les Paul

[bluesmasters.yoov.io](http://bluesmasters.yoov.io)

Win **Gibson Les Paul** Guitar

View or Enter Blues Contest

### Gibson Les Paul Used

[www.webcrawler.com/](http://www.webcrawler.com/)

Search multiple engines for

**gibson les paul used**

See your ad here >

Google

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/](http://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

132,844 people +1'd or follow Macy's

Wedding Registry

Gift Cards

Free 7-Pc. Gift w/ Lancome Purchase

Go Red for Women

Black History Month

Become a Facebook Fan

### Macy's - Shop Fashion Clothing & Accessories - Official Site - Macys ...

[www.macys.com/](http://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 ...

### Macy's Wedding Registry

Macy's Wedding Registry- Create,

modify or search a bridal ...

### Women's Clothing, Clothes

Shop Women's Clothing at Macy's.

Macy's.com carries clothing for ...

[More results from macys.com >](#)

### Home Store

Furniture - Kitchen - Home Decor -

Sale & Clearance - Mattresses

### Shoes

Women's Shoes - Pumps - Womens

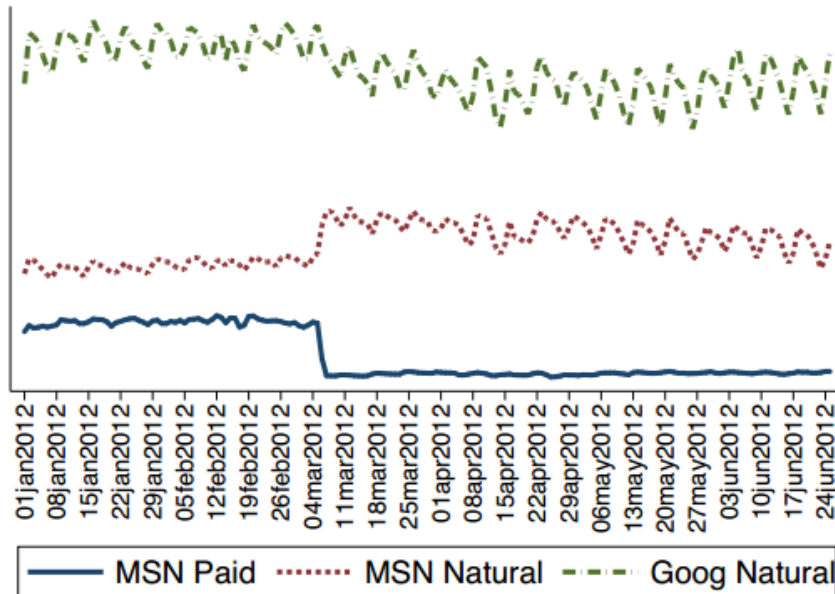
Sandals - Flats - ...

### Men's

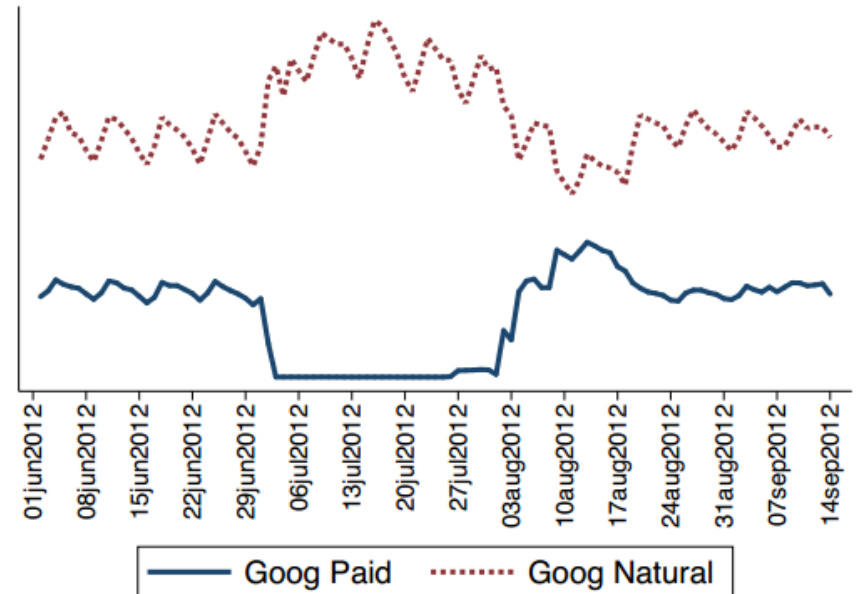
Browse our selection of Men's

Clothing and the latest trends in ...

Figure 2: Brand Keyword Click Substitution



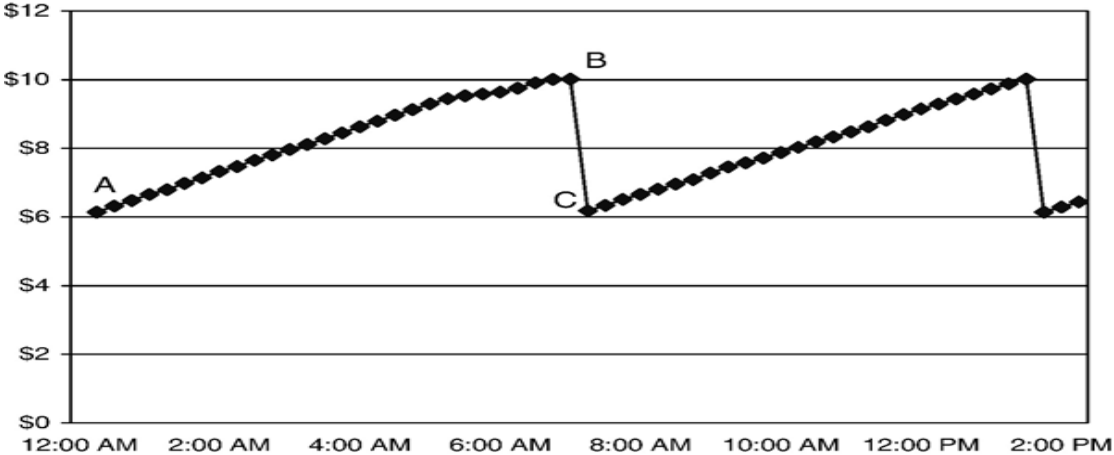
(a) MSN Test



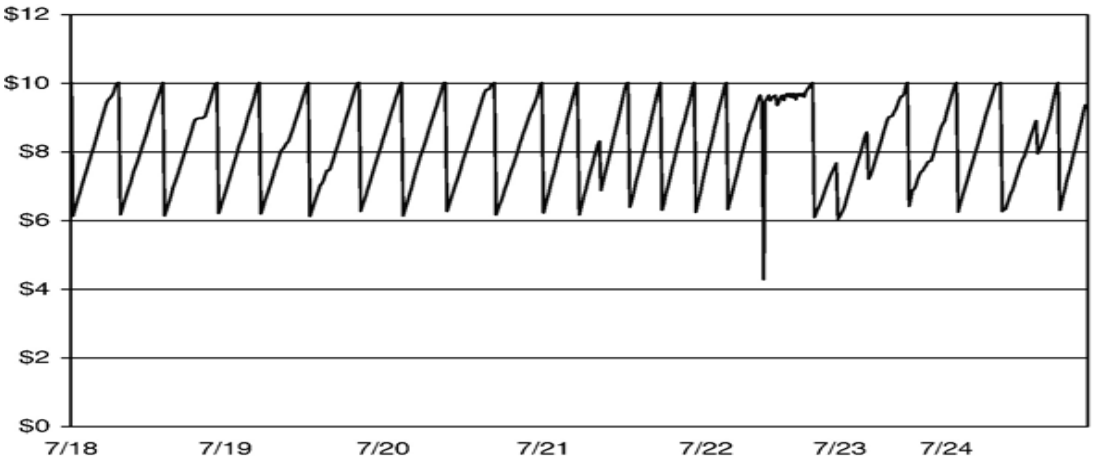
(b) Google Test



# Adaptation in AdWords Auctions



(a) 14 hours



(b) 1 week

# Adaptation (gone wrong)

The screenshot shows the Amazon website interface. At the top left is the Amazon logo. Navigation links include 'simon's Amazon.com', 'Today's Deals', 'Gift Cards', and 'Help'. On the right, there's a promotion for 'The All-New kindle fire HD' with an image of the device. Below the navigation is a search bar with 'Books' selected and a 'Go' button. User account information shows 'Hello, simon Your Account' with a dropdown arrow. There are also links for 'Join Prime', 'Cart' (showing 0 items), and 'Wish List'. A secondary navigation bar includes 'Books', 'Advanced Search', 'Browse Subjects', 'New Releases', 'Best Sellers', 'The New York Times® Best Sellers', 'Children's Books', 'Textbooks', and 'Sell Your Books'. The main product listing features a book cover for 'Introduction to Psychology, Sixth Edition' by Rod Plotnik. The title is 'Introduction to Psychology (High School/Retail Version) 6th edition by Plotnik, Rod published by Wadsworth Pub Co Paperback [Paperback]'. Below the title is the author '-Default- (Author)' and a link to 'Be the first to review this item' next to a 'Like (0)' button. A green banner states 'Available from these sellers.' Below that, it shows '1 new from \$65,364,818,636.00'. To the right of the product listing is a blue sidebar with a yellow 'See all buying options' button, a 'Sell on Amazon' button, and an 'Add to Wish List' dropdown menu. At the bottom of the sidebar are social sharing icons for 'Share', email, Facebook, Twitter, and Pinterest.

amazon

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 ▾

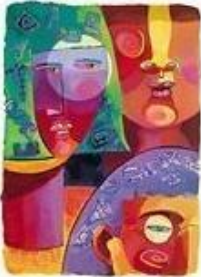
Join Prime ▾

0 Cart ▾

Wish List ▾

Books | Advanced Search | Browse Subjects | New Releases | Best Sellers | The New York Times® Best Sellers | Children's Books | Textbooks | Sell Your Books

INTRODUCTION TO PSYCHOLOGY SIXTH EDITION



ROD PLOTNIK

Introduction to Psychology (High School/Retail Version) 6th edition by Plotnik, Rod published by Wadsworth Pub Co Paperback [Paperback]

-Default- (Author)

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1 new from \$65,364,818,636.00

1 new from \$65,364,818,636.00

See all buying options

Have one to sell? [Sell on Amazon](#)

Add to Wish List ▾

Share    

# 5. 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. Kayak fare forecaster).

## 6. 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 Youtube)
  - ▶ 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)
  - ▶ Freemium (e.g. Dropbox)

# 7. Information and Attention

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- ▶ **The internet promises to lower search costs**
  - ▶ Easy to visit many stores.
  - ▶ Price comparison websites.
- ▶ **However, there is 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**
  - ▶ Drudge vs. Google news.
  - ▶ Netflix or Spotify need to recommend music.