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Internet Technology and E-Business

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Outline

- Amazon.com
- Free shipping?
- Latency-Bandwidth Tradeoff
- Dynamic Pricing by Software Agents
- Electronic Commerce Environment
- Some Legal Issues
- Taxes on the Internet
- Ethics and the Internet

Amazon.com

- New York Times 4/24/2002:
  - Challenging skeptics who said that it's business had stagnated, Amazon.com said today that sales in the first quarter had grown faster than expected and that its loss was less than expected.
  - "Lowering prices is working for us," Mr. Bezos said . . . "Driving unit volume in our business really does reduce costs."
  - Analysts were surprised at how little pain the free shipping offer appeared to have caused Amazon:
    - Revenue from shipping up $7 M to $89 M
    - Shipping Costs up $3 M to $90 M

Amazon.com

- Wall Street Journal 4/24/2002:
  - Sales rose 21% from last year
  - Loss: $23.2 M - ($234 M last year)
  - Revenue: $ 847 M - ($700 M last year)
  - Plans to expand price cut of 30% to all books over $15
  - Revenue for year predicted to grow 15% to $3.59 B
  - “Our low-price strategy is working,” said Warren Jenson, the company’s chief financial officer

Web Merchants Bring Back Free Shipping

- Wall Street Journal 4/24/2002:
  - Free shipping is back . . .
  - . . . with strings
    - Spend $99 or more . . . $50 . . . $25
    - Wait longer for shipping
    - Only products weighing under 20 lb
  - Shoppers *hate* to pay for shipping
  - eBags Inc. sees 5% more visitors when it offers free shipping
  - Nevertheless, shipping spending is *increasing* (up 27%)

Web Merchants Bring Back Free Shipping

- Wall Street Journal 4/24/2002:
  - Is free shipping free?
    - Not for the retailer
    - Customers often do not return when offers end
    - Shipping costs often hidden in higher prices!

Latency/Bandwidth Tradeoff

- By *L. Kleinrock*, a key founder of Internet (ArpaNet in those days!) Technology, including packet switching
- *http://www.lk.cs.ucla.edu/LK/Bib/PS/paper165.pdf*
- What is a gigabit?
- Bandwidth in fiber optics has caused:
  - The technical bottleneck is the switch or router
  - The cost bottleneck is the switch or router
- This is the reverse of just a few years ago!

Latency/Bandwidth Tradeoff

- What is Latency?
  - Delay in round-trips
- C: network capacity
- b: bits in a data packet
- L: network length (miles)
- a = 5LC/b
- 5 (approx.) microseconds/mile for light!

Latency/Bandwidth Tradeoff

- a = 5LC/b
- Basically: how many packets can be pushed in one end before one arrives at the other
- This is an extended measure of latency!
- What happens of “a” is very large for your applications?
  - Delays (at very high speeds)?
  - Bursts?

Latency/Bandwidth Tradeoff

- Kleinrock's table:

Network Type	The "a" Parameter
LAN	0.05
WAN	1.0
Satellite	12.5
Fiber link	15,000.0

Latency/Bandwidth Tradeoff

- For example, to send a 1 Meg file down a 1.2 GB/sec link
- The latency is the dominant factor in the delay of this file! Bandwidth is no bottleneck at all!
- Processes that require high interaction rate will have limitations! High data volume not as limiting!
- What business advantages/disadvantages will we see?

Latency/Bandwidth Tradeoff

- Speed of light is our ultimate limiter
- Problems with closed control feedback for flow control!
- The whole of computer processing may go to computations with light (light based processors)
- What might this mean about the possibility of charging for packets over the Internet?

Dynamic Pricing by Software Agents

- *J.O. Kephart , J.E. Hanson, and A.R.Greenwald.*
- *http://www.research.ibm.com/infoecon/paps/rudin.pdf*
- Information Economy: information drives agents or bots that interact in a giant global market place
- Transactions will be very fast: will humans really be able to participate?
  - I'll need that book by this afternoon: send your bot to negotiate for you.
  - Your bot finds hundreds of other bots with similar desires & negotiates a large discount deal in seconds

Dynamic Pricing by Software Agents

- Example problem is a pair of pricebots:
  - Amazon.com v. books.com
  - Say each has a pricebot that looks at the other's site for a price which it undercuts
  - If they get in a cycle, then the price will go below the marginal cost!
- Is this really a plausible problem?
  - What have we discussed that says this is not likely to really happen a lot?
- Why might sites not give prices to bots?

Dynamic Pricing by Software Agents

- New intermediaries: intermediary agents
- Re-intermediation?
- These agents will be very expert in very narrow domains
- Salebots and pricebots
- Will everything become a continuous double auction?

Dynamic Pricing by Software Agents

- What are the ramifications if every market becomes a continuous double auction?
  - For salebots and pricebots?
  - The humans buying products/services?
  - The firms selling or buying products/services?
- Dynamically posted pricing
  - Segmentation based
  - Managerial based: change with the times and supply and demand

Dynamic Pricing by Software Agents

- What do brick-and-mortar stores offer?
  - Entertainment
  - Relaxing environment
- Internet stores, so far, have largely focused on the price attribute: why?
  - Easy attribute to play with
  - A very significant attribute under any measure
- What are the next attributes for the Internet?
  - Will it stay focused on commodities and B2B?
  - Internet based brands (other than retail outlets)?

Dynamic Pricing by Software Agents

- The behavior of the pricebot and salesbot interaction
  - Salesbot: wants to max profit
  - Pricebot: wants to minimize price
- What about perceived value?
  - How does perceived value change over time?
  - Which attributes of a product/service does perceived value work from?
- As an Internet magnate, how might you instruct your management to deal with bots?

Dynamic Pricing by Software Agents

- The authors present three different algorithms for the pricebots and salesbots to negotiate with.
- Focus on salebots:
  - GT: Interesting game-theoretic framework: looking for Nash Equilibrium among prices for sellers. Essentially local optimality
  - MY: myoptimal: follow competitor's prices and push yours up as soon as you can
  - DF: derivative follower: experiments with raising and lowering prices to make most profit

Dynamic Pricing by Software Agents

- Conclusions?!?!
- Is this really “far out”?
- What bot will you “hire”?
- How do you expect pricebots and salesbots to effect the world?

Electronic Commerce Environment

International, Legal, Ethics and Tax

- International
  - Language/translation issues
  - Cultural issues
  - "Localization"
  - Infrastructure issues
    - e.g. flat-rate telephone access

Electronic Commerce Environment

- Legal
  - Borders and jurisdiction
    - Power
    - Effects
    - Legitimacy
    - Notice
  - Jurisdiction on the Internet
    - Subject-matter
    - Personal
      - Forum Selection clauses
      - Long-arm statutes
    - International Commerce

Electronic Commerce Environment

- Legal
  - Contracting
    - Written contracts
    - Warranties
    - Authority to form contracts
  - Web Site Content
    - Trademark Infringement
    - Deceptive Trade Practices
    - Advertising Regulation

Electronic Commerce Environment

- Ethics
  - Defamation
  - Privacy Rights and Obligations
  - Personal Data Protection

Electronic Commerce Environment

- Taxation
  - Income taxes
  - Sales taxes

Some Legal Issues

- May I copy, print and email?
  - Fair use
- May I scan any image?
- May I use images from other Web Sites?
- May I freely link to other Web Sites?
  - Framing
- What can I do about links to my site?
- Midi, WAV and MP3 files

Taxation and the Internet

- *Hal Varian's* paper and *R. P. Strauss's* paper
- The situation
  - 1998 total state Sales Taxes:
    - $192 billion dollars
    - About 25% of state and local tax revenue
    - Total comes to about $770 per capita
  - States without Sales Tax:
    - Alaska, Delaware, New Hampshire, Montana, and Oregon
    - About 3% of US population

Taxation and the Internet

- Economist Goolsbee quoted by H. Varian:
  - Imposing Sales Tax on out-of-state goods could drop Internet sales by up to 25%
- Out-of-state sales:
  - Only way appears to be “Use Taxes” for use of something in your state
  - Hard to enforce: no jurisdiction over out-of-state sales
  - Experiments of adding out-of-state sales to **individual** Income Taxes failed (no surprise here!)
  - Firms’ “Use Taxes” are much more enforceable since firms can more easily be audited and measured

Taxation and the Internet

- Businesses pay about 40% of all Sales Taxes
- Economic arguments abound: don't distort the cost structure in different states with complex and different Sales Taxes!
  - Will make industry have to price and spec merchandize in very strange ways
  - The distortions will have an effect on the economy
- VATs: Value Added Taxes
- Vertical Firm Structure v. Horizontal Firm Structure

Taxation and the Internet

- VAT v. Use Tax
  - VAT allows the subtraction of tax at each non-retail step
  - Use Tax takes the money (in practice) from businesses and not final use
    - This spreads the tax burden over all of the products/services the firm sells to the consumer
- By the Commerce clause in the US Constitution: states cannot levy a Sales Tax on firms without a physical presence in them
- But, Congress can fix this!

Taxation and the Internet

- Options:
  - Maintain status quo
    - Optimistic estimates: by 2002 online retail sales will represent about 1% of all retail sales
    - Catalog sales represent 4% now!
  - Make the Internet Sales Tax Moratorium Permanent?!?!
  - Coalitions of states having tax reciprocity?
  - Trusted 3rd Party tax person?

Taxation and the Internet

- Eliminate all Sales Tax (or eliminate all other taxes?)
  - Appeared in 1930s to deal with Government shortfalls from Great Depression
  - "Temporary measure"
  - Focus on goods and not services!
  - Most groceries are exempt too!
  - Totally, only 40% of all consumption is Sales Taxed!

Taxation and the Internet

- A good tax system should:
  - Generate sufficient revenues without constant rate or base changes
  - Be easy and inexpensive to administer and comply with
  - Alter consumer and business choices as little as possible
  - Compel tax payments

Taxation and the Internet

- In general, does taxing consumption make sense?
- Does Sales tax make the best tax of consumption?
- The best way seems to be to make savings tax deductible!
  - Why?
- VAT is not applied to exports, nor is Sales Tax
- Same issues across country boundaries
- What about a stream of bits? How do we tax this?

Taxation and the Internet

- Who takes which sides?
- National Advisory Commission on Electronic Commerce (ACEC)
  - Initially plagued with problems
  - Established Federal Moratorium in 1998 on Sales Tax on the Internet
  - See the development of the railroads in the last century for such indirect (or direct) donations

Taxation and the Internet

- Will imposing tax on the Internet bring down the NASDAQ even more?
- Interesting clauses:
  - Amazon.com: “RISK OF LOSS: …`the risk of loss and title for such items pass to you upon our delivery to the carrier’ ”
  - Amazon.com: “APPLICABLE LAW: … Laws of the State of Washington…”

Taxation and the Internet

- Where is the fairness in all of this?
- Who to tax, why to tax them?
- Who benefits from the taxes?
- Will brick-and-mortar stores atrophy without breaks on sales tax like the Internet?
- The 30,000 different US sales tax zones!
- The burden of collection and rectification is on business!

Ethics and the Internet

- Biggest Ethical Problems?
  - Privacy
  - Security
  - Taxation
  - Universal Access
  - Autonomy?
- All powerful tools can be used for or against people

Ethics and the Internet

- Which of these ethical problems will likely become magnified in the future?
- Where to from here?

Ethics and the Internet

- Privacy Policies surveyed
  - 100% of top shopping sites collect personal information
  - 51% provide link to privacy policy
  - 35% link from every page collecting personal information
  - 20% belong to industry self-regulation group
  - 24% use opt-in (consent) for all collection and use
  - 33% allow users to view and correct their personal information
  - 21% appear to limit use to original purpose
  - 58% specify the purpose of collection
  - 35% allow advertising on their pages
  - 86% utilize cookies