


The Evolution of E-Commerce

History Repeats Itself (again)



Daniel V. Klein
dan@klein.com



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In the beginning...

...the Earth was without form, and void; and darkness was on the face of the deep.



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Where E-commerce began

- Telegraph (demonstrated in 1844) spread with the railroads in the mid 1800's
 - Coast-to-coast by 1861
 - Ordering goods and services remotely
 - Wire transfer of funds (backed by physical transit later on by Express)
 - The promise of goods and of payment
- Transatlantic Cables – 1857-1866

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Electronic Genesis


- Until very recently, only computer people had computers
- Started to change in the 1980's
- Paradigm shift in 1995 – the World Wide Web



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Checks & Credit Cards

- In the early 19th Century, there were cheques
- Credit cards only started to become widely accepted in the 1950's



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Evolution & Natural Selection

- Natural selection works in nature
- It also works in computers & business
 - Digital Equipment Corporation
 - Microsoft
 - Linux
- It also works in politics and e-commerce

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Church and State

- Taxation is okay
 - You have to pay for armies
- Killing is okay
 - They are infidels
- Theft is okay
 - Spoils of war
- Lending money at interest is bad
 - A venial sin!



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You'll do it *my* way

- Big companies try to set rules
- Need special accounts with special banks, everyone uses *my* bank (or pay extra)
- Special hardware attached to your computer
- Place order online, call company with credit card information, exchange PIN numbers

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Company Store, Company Scrip

- People work, are paid in company scrip
- Can use scrip to shop at company store
- Scrip has theoretical cash value
 - Cannot readily exchange for dollars
 - Company store engages in price gouging
 - Employees are slaves

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Cybercash / Cyberwallet

- You buy cyberdollars with real dollars
- Clients buy services with cyberdollars
- Companies accept cyberdollars as payment
- Companies sell cyberdollars to get real dollars
- Transaction fees when you exchange

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Private Banks

- In 17th – 19th centuries, banks were private
- Uninsured
 - If your bank was robbed, you lost your money
 - If your bank folded or absconded, you lost
- Largely unrelated
 - No ATMs, elaborately coded letters of credit

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Cryptography

- Secure communication is the key
- Security is keeping a secret
 - Can you hear it?
 - Can you understand it?
 - Can you reproduce it?



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Purchasing Agents

- You hire agent, give letter of credit
- Agent goes on road
 - Sees goodies
 - Sends samples
 - You send okay
 - Buys on credit, ships goodies
 - Credit cleared later

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First Virtual

- Client signs up with credit card
 - By telephone
- When buying, submits form
 - Server sends email to FV
 - FV sends email to client
 - Client sends email to FV
 - FV sends email to server
 - (Can view product before paying!)

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Industrial Revolution

- You make stuff, you want to sell it
- Unless you are *big*, you get robbed
 - Hire thugs
 - Cost of doing business
- Unless you are *big*, transactions are small
 - and local or highly specialized
- Wholesalers / retailers

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E-Commerce Revolution

- If you want to sell, you need a merchant account
 - Have to be big, need credit history, nope - sell on trust, send me a check, get screwed
 - Don't have to be big, just pay a lot, hard to interface to banks
- Wholesalers
 - Have merchant account, take 15%, take risks
 - Enable lower class to sell to world

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Same Problems, Different People

- Large number of credit card wholesalers
 - Requires lots of work
 - Requires lots of security
- Mergers and acquisitions
- Survival of the fittest, fattest, fastest



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What's Next?

- Microtransactions
 - Pay as you go (or use)
 - Utility service analogy
 - Rent with utilities included
- Currently not cost effective
 - Credit card transactions too expensive
 - Tracking and reporting issues

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So, nu?

- There is no difference between commerce and e-commerce
- Electronic transactions are just a different type of payment
- Protocols have to fit human needs and human models – not the other way around
- Your customers are not geniuses

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Okay, what is for sale?

- Physical media
 - Books, parts, cars, music, antiques, junkie, etc.
- Virtual media
 - Programs, memberships, searches, greeting cards, money, etc.
- Advertising
 - Anyone can be a publisher!

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Physical

- Barnes & Noble, L.L.Bean, LandsEnd, Clinique, Camera World
- Books.com, buy.com, pets.com, groceries.com, wine.com, sparks.com
- Amazon.com, PayPal.com

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Virtual Media

- Sell once
 - Buy a program (or picture, or license)
- Sell repeatedly (monthly/annually)
 - Buy a membership in a site
 - Mainly adult-site memberships, others exist
- Sell sporadically (access/use)
 - Buy information per search
 - Moving money (PayPal, iBill)

Advertising

- Anyone can advertise!
 - Selling ads is main motivation of free sites
 - Not all ads are banners!
- Different payment schemes
 - Per-impression
 - Per-click
 - Per-sale



Paying for Ads

- Per-impression
 - Fairest to advertiser (bandwidth costs), but advertiser must trust publisher
- Per-click
 - Fairest to both (both can track traffic, publisher can pull unsuccessful ads), but susceptible to abuse by both sides (click-bots and trimming by “uniques”)
- Per-conversion
 - Fairest to advertiser (pay only for results), but publisher must trust advertiser

Two Distinct Marketplaces

- “Adult”
 - 5–15% click-through rate
 - 0.1–1% conversion rate
 - Lots of traffic from little advertisers
- “Mainstream”
 - 0.25–1% click-through rate
 - 2–10% conversion rate
 - Most traffic through big advertisers

Payment Schemes

- Per Impression
 - Only way on big mainstream advertisers
- Per Click
 - Few adult sites use it any more – lots of abuse
 - Many mainstream sites use it
- Per Conversion
 - Mainstream and adult

Simple Click-bot



```
#!/usr/bin/perl

use HTTP::Request;
use LWP::UserAgent;

$ua = new LWP::UserAgent;
$ua->agent("Mozilla/4.76");
$req = new HTTP::Request(GET =>
    "http://tracker.loser.com/count?id=1a47cb3");

while (1) {
    $ua->request($req);
    sleep int rand 16;
}
```

Per-Conversion Payment

- Different pay-out schemes (depending on business being advertised)
 - Per-referral fee
 - Per-signup fee
 - A fraction of sales
 - One-time
 - Recurring
 - A fraction of *anticipated* sales

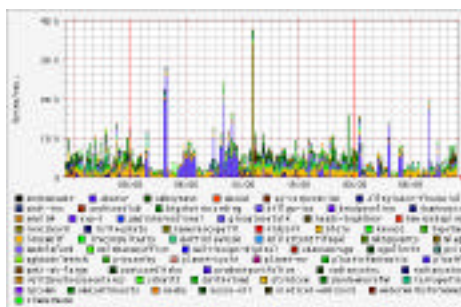
Not the end...

- Information super-highwayman
 - New kinds of sales
 - New kinds of commerce
 - New kinds of theft
 - Different kinds of insurance
 - Adaptive restrictions
- Back to the Wild West!

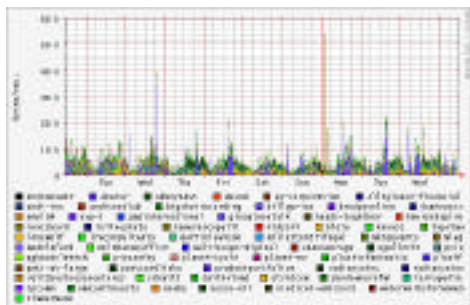
It was the best of times, it was the worst of times.

- Instant gratification
 - Assessing customer feedback
 - Assessing ad effectiveness
- Loss of privacy
 - Voluntary loss
 - Involuntary loss
- Loss of anonymity
- Big Brother is *already* watching you!

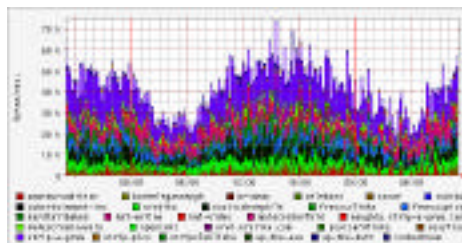
Mainstream Sites - 1 day use



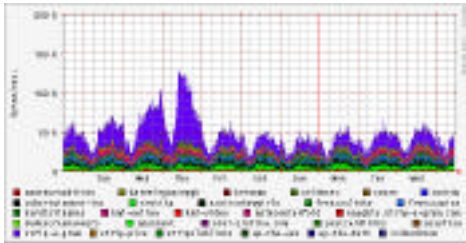
Mainstream Sites - 1 week use



Adult Sites - 1 day use



Adult Sites - 1 week use

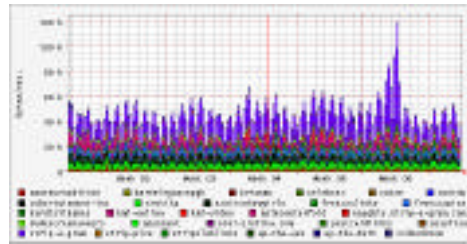


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Adult Sites - 1 month use



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So... what's next?

- Read science fiction!
 - Chester Gould (<1935) – wrist radio
 - Frederick Pohl (1965) – joymaker
 - John Brunner (1974) – information society
 - Robert Heinlein (1959) – computer immersion
 - implanted computers, crypto, global networks, intelligent agents, nanobots...

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