

Digital Rights Management: Desirable, Inevitable and Almost Irrelevant

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DRM Paradoxes:

- Conferences, papers, industry support
- A few widespread deployments (iTunes, ...)

but

- Steve Job calls for end to music DRM
- New York Times, Sept. 19, 2007: “We are ending TimeSelect, effective today.”

Outline:

- “The most important thing is to *maximize the value* of your intellectual property, not to protect it for the sake of protection.”

Shapiro and Varian

- DRM often gets in the way of maximizing value
- Ecommerce needs occasional “speed bumps” (DRM)
- For effective application, security of DRM will take back seat to usability
- DRM to be widespread, but may play minor role, and be mostly insecure

Modern Economy:

- Strong incentive for price discrimination
 - Increasing fixed, decreasing marginal costs
 - Decline of privacy
 - Can find out buyer's willingness to pay
 - Can control resale
- Opposed by counter trends:
 - Political action
 - Willingness to pay more for simple prices
 - Network effects

Standard economic argument for price discrimination

Charlie: willing to prepare a report on digital cash for \$1,500

Alice: willing to pay \$700

Bob: willing to pay \$1,000

Uniform pricing makes transaction impossible

Charging Alice \$650 and Bob \$950 makes everybody better off (in conventional economic model)

Politics makes for strange bedfellows, but so does economics:

On average, for each dollar American consumers pay for prescription drugs, the Germans are paying 71 cents; the Swedes, 68 cents; the British, 65 cents; the French, 57 cents, and the Italians, 51 cents. Unfortunately, U.S. policy allows pharmaceutical industry to maintain that disparity. . . . It's a moral outrage that Congress continues to allow millions of elderly and chronically ill Americans to suffer and die because they cannot afford the inflated prices charged for pharmaceuticals.

Congressman Bernie Sanders
letter to *Barron's*

Versioning is motivated by incentives to price discriminate:

It is not because of the few thousand francs which have to be spent to put a roof over the third-class carriages or to upholster the third-class seats that some company or other has open carriages with wooden benches. What the company is trying to do is to prevent the passengers who pay the second class fare from traveling third class; it hits the poor, not because it wants to hurt them, but to frighten the rich.

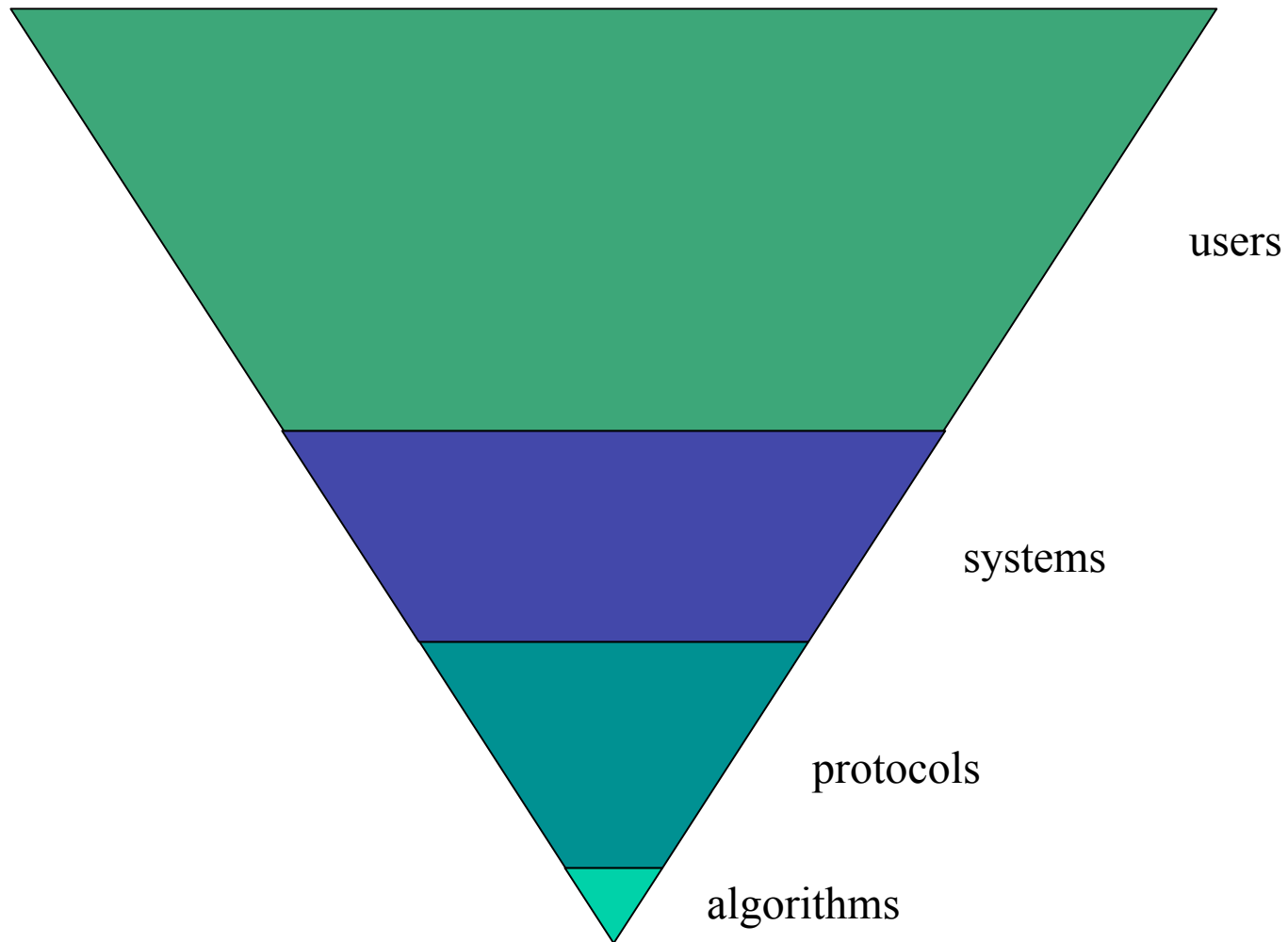
And it is again for the same reason that the companies, having proven almost cruel to the third-class passengers and mean to the second-class ones, become lavish in dealing with first-class passengers. Having refused the poor what is necessary, they give the rich what is superfluous.

Jules Dupuit, 1849

Secure systems (DRM and others):

- Several decades of proof we can't build them
- If we could, we could not live with them
 - Secure systems would stop secretaries from forging their bosses' signatures

Security Pyramid:



Honor System Virus :

This virus works on the honor system.

Please forward this message to everyone you know and then delete all the files on your hard disk.

Thank you for your cooperation.

Intentional ambiguity (in proposed SEC rule for corporate lawyers):

Evidence of a material violation means information that would lead an attorney reasonably to believe that a material violation has occurred, is occurring, or is about to occur.

VS.

Evidence of a material violation means credible evidence, based upon which it would be unreasonable, under the circumstances, for a prudent and competent attorney not to conclude that it is reasonably likely that a material violation has occurred, is ongoing, or is about to occur.

It is easy to make fun of lawyers, but don't we all like to have some slack in our lives?

1980s: The “Golden Age” of civilian cryptography and security:

But also:

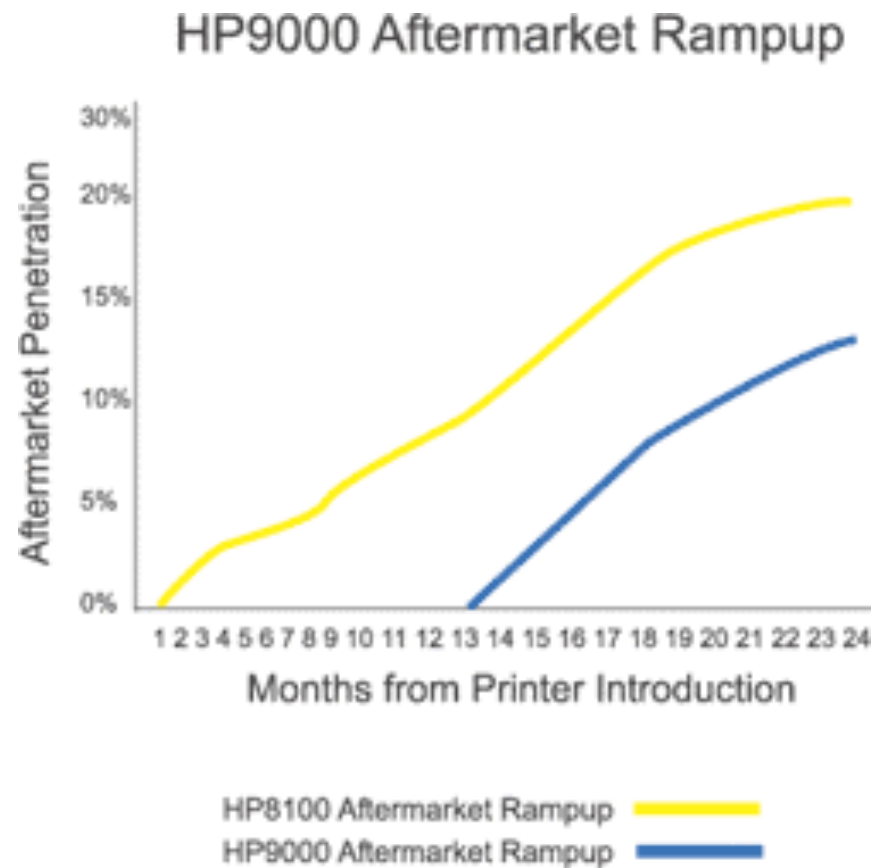
The “Golden Age” of fax, including faxed signatures

Why does a fax signature work?

- Hard to do serious damage with a single forged fax
- Fax usually just one of many elements of an interaction (involving heterogeneous elements, such as phone calls, emails, personal meetings, ...)

The role of a fax signature has to be viewed in the context of the entire transaction. (And it is not used for definitive versions of large contracts, ...)

Quantifiable benefits of (incomplete) security:



Other ways to skin the cat (other than explicit price discrimination):

Microsoft Office (for Windows 3.11)

components:

Access	\$225
Excel	\$225
PowerPoint	\$225
Word	\$175
Total:	\$850
Office Pro bundle:	\$389

Bundling is an alternative to price discrimination in reducing consumer surplus

Willingness to pay:

	word processor	spreadsheet
Alice	\$100	\$300
Bob	\$300	\$100

Pricing and revenue:

\$100 for each program	\$400
\$300 for each program	\$600
\$400 for bundle	\$800

Site Licensing:

# employees	value
900	\$ 0
10	\$ 10
10	\$ 20
10	\$ 30
10	\$ 40
10	\$ 50
10	\$ 60
10	\$ 70
10	\$ 80
10	\$ 90
10	\$100

1000 employees

Sales to individuals: optimal price either \$50 or \$60

revenue = \$3,000

Site licensing: revenue = \$5,500

Consumers' willingness to pay more for simple pricing:

What was the biggest complaint of AOL users? Not the widely mocked and irritating blue bar that appeared when members downloaded information. Not the frequent unsolicited junk e-mail. Not dropped connections.

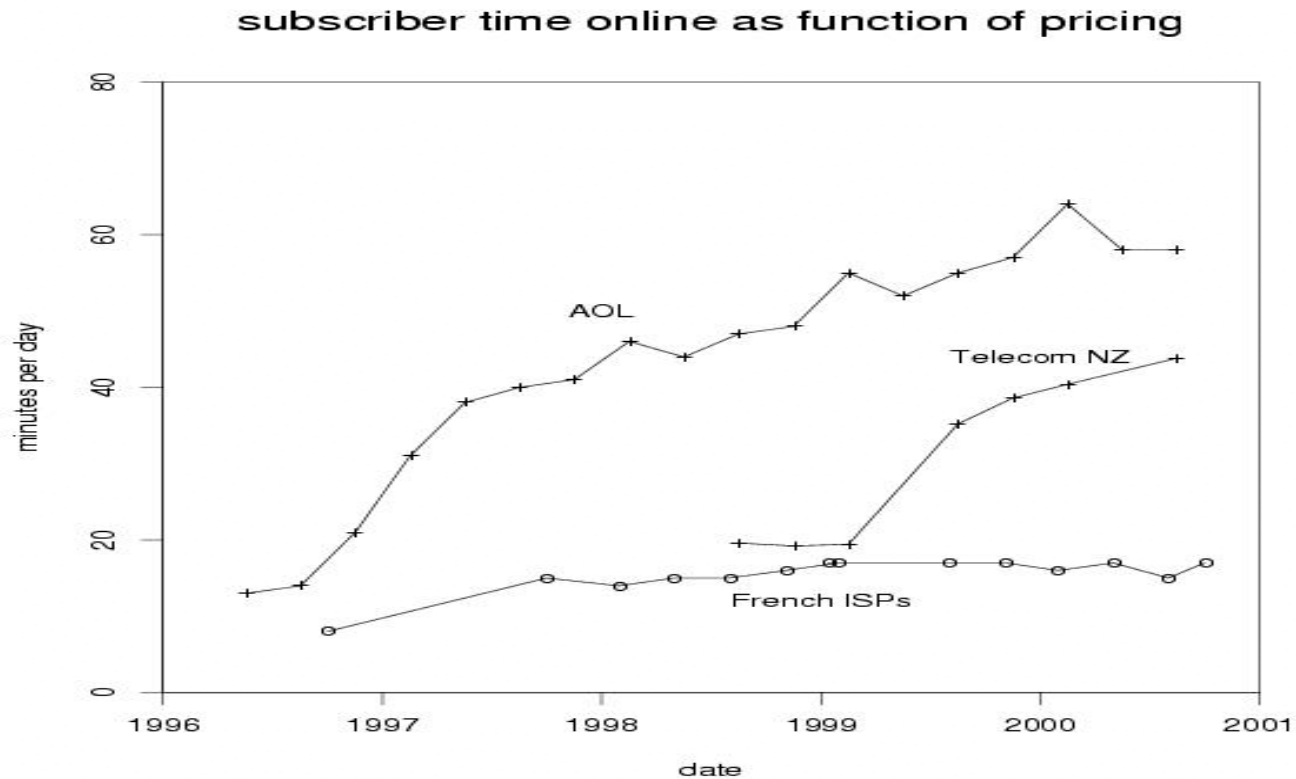
Their overwhelming gripe: the ticking clock. Users didn't want to pay by the hour anymore.

Case had heard from one AOL member who insisted that she was being cheated by AOL's hourly rate pricing. When he checked her average monthly usage he found that she would be paying AOL more under the flat-rate price of \$19.95. When Case informed the user of that fact, her reaction was immediate.

'I don't care,' she told an incredulous Case. 'I am being cheated by you.'

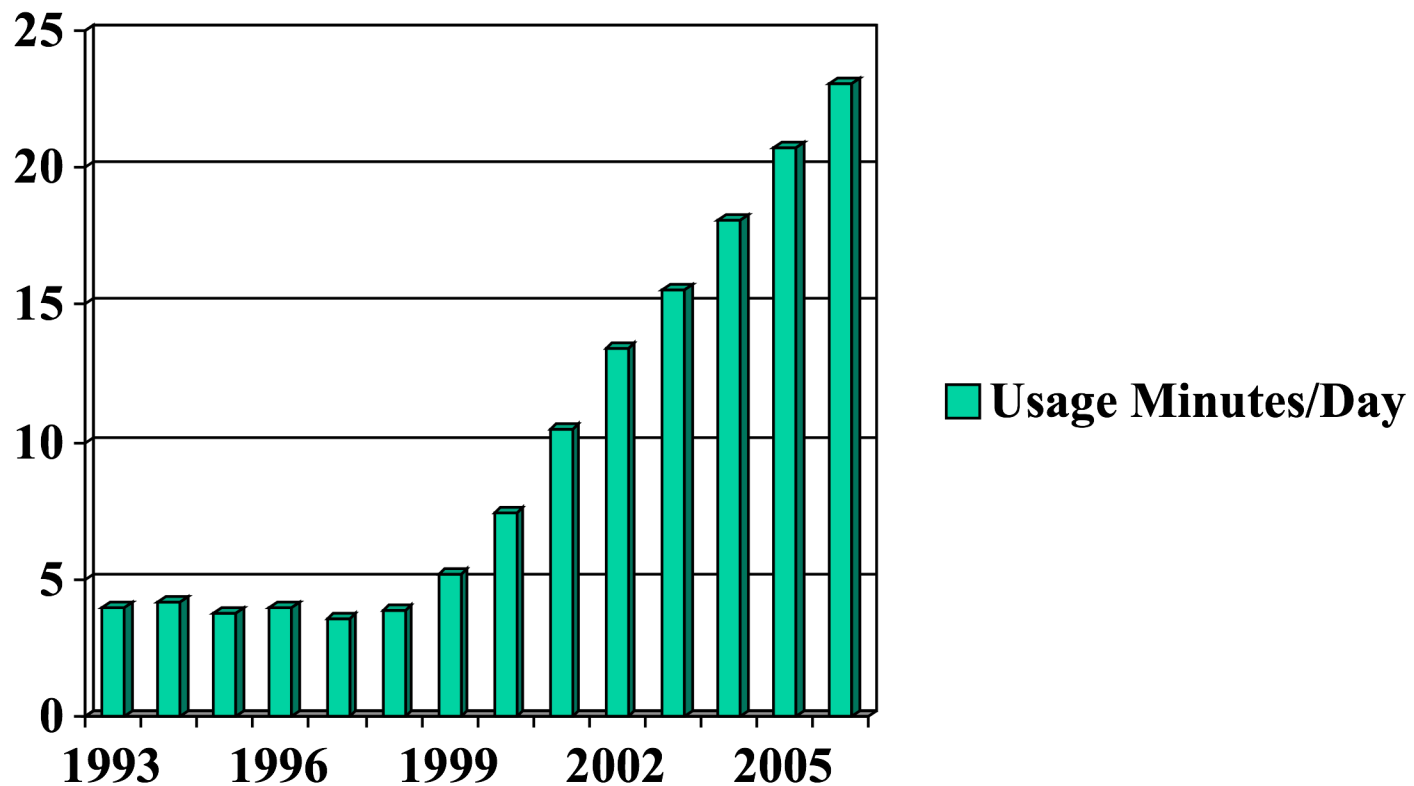
from aol.com: How Steve Case Beat Bill Gates, Nailed the Netheads, and Made Millions in the War for the Web, Kara Swisher

Flat rates as a way to stimulate usage:



Almost flat rates :

U.S. cell phone usage, minutes per day around June of each year.



Network effects :

Although about three million computers get sold every year in China, people don't pay for the software. Someday they will, though. And as long as they're going to steal it, we want them to steal ours. They'll get sort of addicted, and then we'll somehow figure out how to collect sometime in the next decade.

Bill Gates, 1998

Long history of content providers resisting new technologies:

When circulating libraries were first opened, the booksellers were much alarmed; and their rapid increase, added to their fears, had led them to think that the sale of books would be much diminished by such libraries. But experience has proved that the sale of books, so far from being diminished by them, has been greatly promoted; as from these repositories many thousand families have been cheaply supplied with books, by which the taste of reading has become more general, and thousand of books are purchased each year by such as have first borrowed them at those libraries, and after reading, approving of them, have become purchasers.

James Lackington
English bookseller, 1746-1815

Conclusions:

- DRM research to flourish
 - industry enamored of maximal control
 - “real option” value
 - academic inertia and love of many knobs to twirl, ...
- Moderate deployment of DRM
- Modest actual usage of DRM
- For practical systems, usability far more important than security

Further data, discussions, and
speculations in papers and
presentation decks at:

<http://www.dtc.umn.edu/~odlyzko>