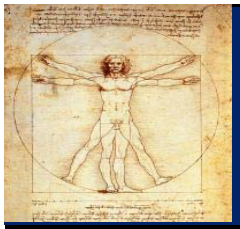
Interoperability, system design and the "DRM thicket"

Andrea Renda
CEPS and Luiss Guido Carli

Milan, 18 November 2005



Prelude: definition

DRM is the talk of the town. But the problem with DRM is not the technology, but the forces behind it. Does it have the potential to support the two main goals of cyberlaw?

- ***Digital Rights Management (DRM)***
  - **(NIST) "a system of information technology (IT) components and services along with corresponding law, policies and business models which strive to distribute and control intellectual property (IP) and its rights"**
    - ***RELs - Machine-readable metadata (ODRL, XrML)***
    - ***Usage contracts (click-wrap)***
    - ***IP licenses***
- ***Pervasiveness***
  - ***"DRM is not a piece of technology loaded onto an end-user device or a service offered through a server. It is a pervasive technology that has to extend across the entire value network if it is to perform its function."***

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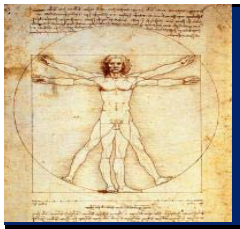

Prelude: goals of cyberlaw

DRM is the talk of the town. But the problem with DRM is not the technology, but the forces behind it. Does it have the potential to support the two main goals of cyberlaw?

1. *Maximizing the value of the Net*
   - *Preserving e2e architecture*
   - *Promoting open standards at remote layers*
   - *Promoting interactive services*
   - *Fight enduring bottlenecks*
2. *Maximizing the value of content made available on the Net*
   - *Incentives for content owners to make content available*
   - *Respect for architecture and system design*
   - *Enable access to specific valuable content*

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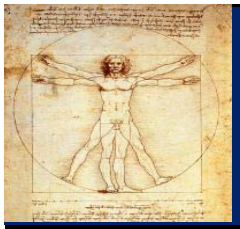

Only a few years ago…

In the early 1990s, the advent of the WWW elicited predictions of all sort. These predictions were apparently incompatible with each other…

- *In cyberspace: code, not law, defines what's possible*

  Lawrence Lessig (from 1996)

- *The Internet will become like a "celestial juke-box"*

  Paul Goldstein (1993)

- *"Copyright is dead"*

  John Perry Barlow (1994)

- *"Almost every marketplace scheme in the information industry could be construed as illegal under our antiquated antitrust laws".*

  Peter Huber (1993)

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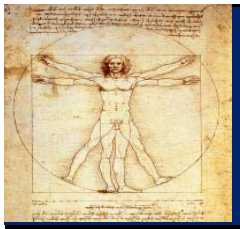

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Cartoon by Peter Steiner. The New Yorker, July 5, 1993 issue (Vol.69 (LXIX) no. 20) page 61

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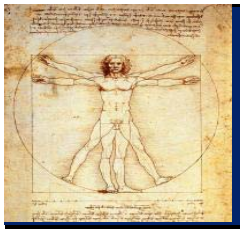

Only a few years ago…

In the early 1990s, the advent of the WWW elicited predictions of all sort. These predictions were apparently incompatible with each other…

"Code is an efficient means of regulation. But its perfection makes it something different. One obeys these laws as code not because one should; one obeys these laws as code because one can do nothing else. There is no choice about whether to yield to the demand for a password; one complies if one wants to enter the system. In the well implemented system, there is no civil disobedience. Law as code is a start to the perfect technology of justice."

Lawrence Lessig (1996)

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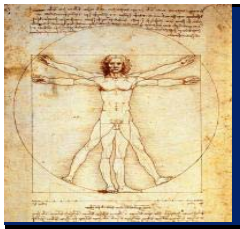

But then...

But immediately after, everyone realized that the celestial jukebox was not (yet) feasible. And that the e2e architecture could significantly jeopardize control by rights owners

- *Digitalization of information*
  - *Information goods = information*
  - *Imperfectly excludable, rival (in production), non-rival (in use), experience good*
- *High-speed bandwith*
  - *Advent of DSL, Cable, Mobile broadband*
  - *Convergence – info superhighway*
- *End-to-end architecture*
  - *Network externalities*
  - *Secondary information markets*
- *Economics of attention*
  - *Preference for flat pricing*
  - *Failure of micropayments*
  - *"clutter effect"*

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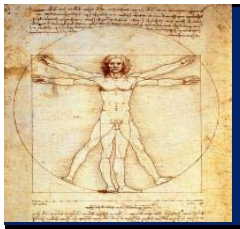

"Architecture v. control"

A few years later, all those commentators were wrong (but Huber). No celestial jukebox, reliance on copyright, constant circumvention of TPM…

The fight for control was violent

- ***Lobbying for legal rules***
  - *Lehman Commission, DMCA, Sonny Bono Act, Broadcast Flag, CBDTPA, IP Protection Act, Berman Bill, INDUCE Act…*
  - *EC Copyright directive, software patents directive, HLG on DRM issues…*
  - *WIPO, Canada, EU25, Korea, Japan…*
- ***Case-law***
  - *Lawsuits against individual users*
  - *Mp3.com, Napster, Aimster, Kazaa, Grokster*
  - *Microsoft (US and EU)*
- ***Spoofing***
  - *Media defender, Overpeer*
- ***Changing the architecture***
  - *AOL/TW Roadrunner*
  - *AT&T @Home*

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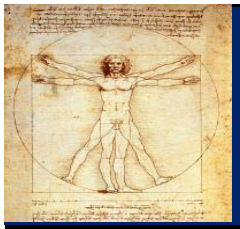
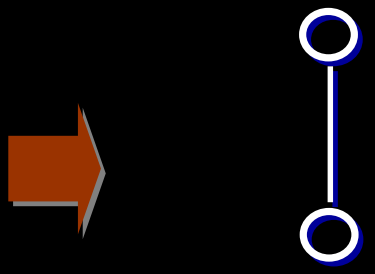


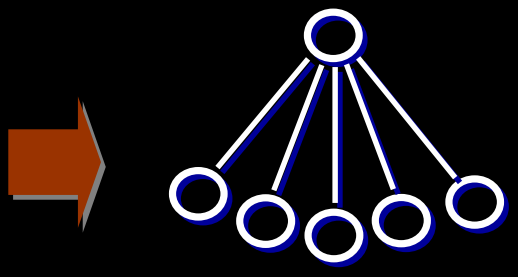
Achilles and the turtle (I)

As p2p emerged as a new phenomenon, the protection offered by copyright law clashed with the new architectural forms studied for the purpose of escaping vicarious liability…

- *Mp3.com (2000)*
  - *One-way downloads*
  - *No sharing*
  - *Space-shifting*
  - *Not fault-tolerant*
  - *Not extensible*
  - *Not lawsuit-proof*



- *Napster (2000)*
  - *Centralized*
  - *Static*
  - *Manageable*
  - *Not extensible*
  - *Not fault-tolerant*
  - *Not lawsuit-proof*



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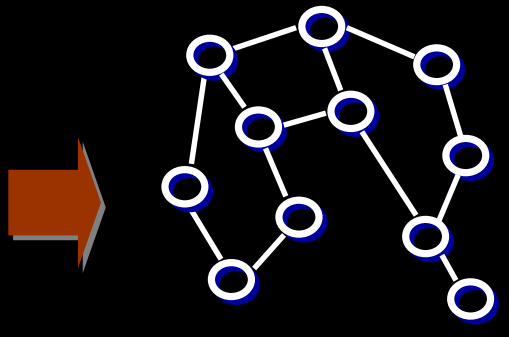
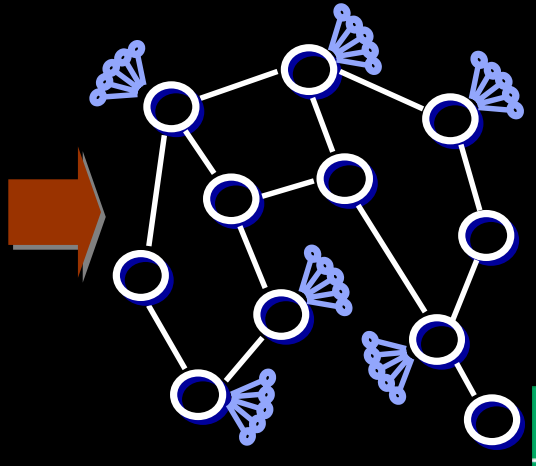
Achilles and the turtle (II)

As p2p emerged as a new phenomenon, the protection offered by copyright law clashed with the new architectural forms studied for the purpose of escaping vicarious liability…

- *Morpheus (2003)*
  - *Decentralized*
  - *Dynamic*
  - *Difficult to manage*
  - *Extensible*
  - *Fault-tolerant*
  - *Lawsuit-proof*



- *Grokster (2003)*
  - *Decentralized*
  - *Dynamic*
  - *Manageable*
  - *Extensible*
  - *Fault-tolerant*
  - *Lawsuit-proof*



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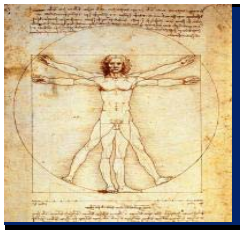

p2p boom!

2 Find MP3
ABC
Acquisition
Adagio
Amini p2p Software
aMule Project
ANts p2p
Anywhere Explorer
Apollon
Applejuice
Ares
Ares p2p
Arliweb Folders
AudioGalaxy Rhapsody
AudioGnome
Axbar
Azureus
BadBlue
BCDC++
BearShare
BitComet
BitComet Accelerator
BitLord
BitSpirit
BitTorrent
BitTorrent Absolute Downloader
BitTorrent Lite
Black Pirate FS
Blubster
BT2Net
Bt2Net Jet-speed Downloader
BTGetit
Carracho
Connect Storm
Crazaa
DC++
Deepnet Explorer
Diet K
Digital Media Server
DIYP2P / Paranoia
DriveHQ
Easy File Sharing Web Server
eDonkey 2000
eDonkey Accelerator
eFileGo
Einstein
Emule
eMule Plus
eXeem
FilePipe
Filetopia
Freenet
Gnucleus
Grokster
Grouper
Haxial KDX
iMesh
iMesh Light
iMesh Revolution
InfocuSoft Photo Share
K-LiteGold
Kast
KaZaa
Kazaa All-in-One
Kazaa Lite Resurrection
KazaaHttp
Knutell
LimeWire
Lphant peer to peer
MagicVortex
MediaGrab!
Mercora IMRadio
Mextractor
MLdonkey
Morpheus
MP3-Wolf
Myster
Network Sunshine
Nodescan
Noxx
P2P ShareSpy
Peer2Mail
PeerFolders
PeerFTP
Personal File Server
Piolet
PixVillage
PruneBaby!
PySoulSeek
Qnext
Searchius
SendLink
Shareaza
ShareDirect
ShareGear
ShareIt
Soulseek
Streamjack Music
The Circle
Torrent Searcher
Torrentopia
TribalWeb
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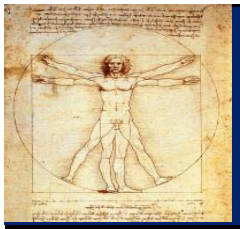
HTTP Commander
WinMP3Locator
WWW File Share Pro
XBT
Xolox
YaCy
ZipTorrent
Zultrax



Achilles and the turtle (III)

Changing the Sony standard was not a good idea. The inducement theory is too broad and leads to undesirable results and uncertainty in the industry

> *"The Court is not blind to the possibility that Defendants may have intentionally structured their businesses to avoid secondary liability for copyright infringement… To justify a judicial remedy, however, Plaintiffs invite this Court to expand existing copyright law beyond its well-drawn boundaries."*
>
> *MGM v. Grokster, 2003*

> *"Nothing in Sony requires courts to ignore evidence of intent to promote infringement if such evidence exists. In addition to intent … the inducement theory requires evidence of actual infringement … There is evidence of such infringement on a gigantic scale. Because substantial evidence supports MGM on all elements, summary judgment for respondents was error."*
>
> *MGM v. Grokster, 2005*

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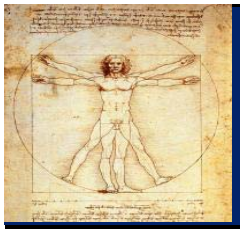

Today…

DRM systems are currently promoted as the only viable solution for migrating towards legal use of content on the Internet. Acceptability is the end, interoperability the means…

- *EU High Level Group*
  - *"EU Institutions and Member States [must] reflect in their policy positions that copyright abuse will not be tolerated, and that protection of content delivered via DRM is the way forward."*
- *Interoperability is key to consumer acceptance:*
  - *Stakeholders should continue work on open, cross-platform DRM systems and standards*
  - *The EU should foster open standards and discuss compliance mechanisms with stakeholders*
  - *Member States should foster open standards, ensure that DRM security will not be undermined and enforce anti-piracy measures*

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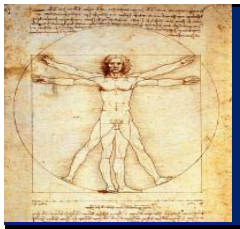

DRM: a reductionist view

From a reductionist perspective, DRM systems can create way more harm than good… but with convergence, a holistic view enables a better understanding

- *Pros*
  - *Effectively fight piracy*
  - *More control for rights holders*
- *Cons*
  - *Still vul[NO]le*
  - *May redu[NO]ease of use and demand, especially if there is no interoperability*
  - *Might (a[NO]rily) restrict freedom to use content*
  - *Might cr[NO] consumer lock-in*
  - *Might become a technology licensing control point and create competitive concerns* — Yes
  - *Are potentially unlimited, and might go too far* — Yes
  - *Might invade people's privacy* — Yes
  - *Might inhibit fair and transformative uses* — Yes

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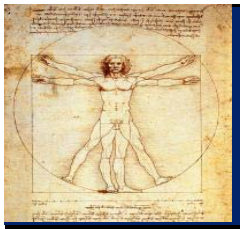

DRM: pending issues

The EU debate has not led to clear hints on how risks associated with DRM will be dealt with.

- *Antitrust law*
  - *Should dominant players grant interoperability to competing content providers?*
  - *Should DRM patent holders be forced to license their IP?*
- *Copyright/Contract interface*
  - *Should DRM usage terms comply with copyright law?*
  - *Should copyright law prevail on shrink-wrap licenses?*
  - *Should copyright law be used as a safety net?*
  - *Should copyright become copy-duty?*
- *e-communications regulation*
  - *"ladder of investment" or "enduring bottlenecks?"*

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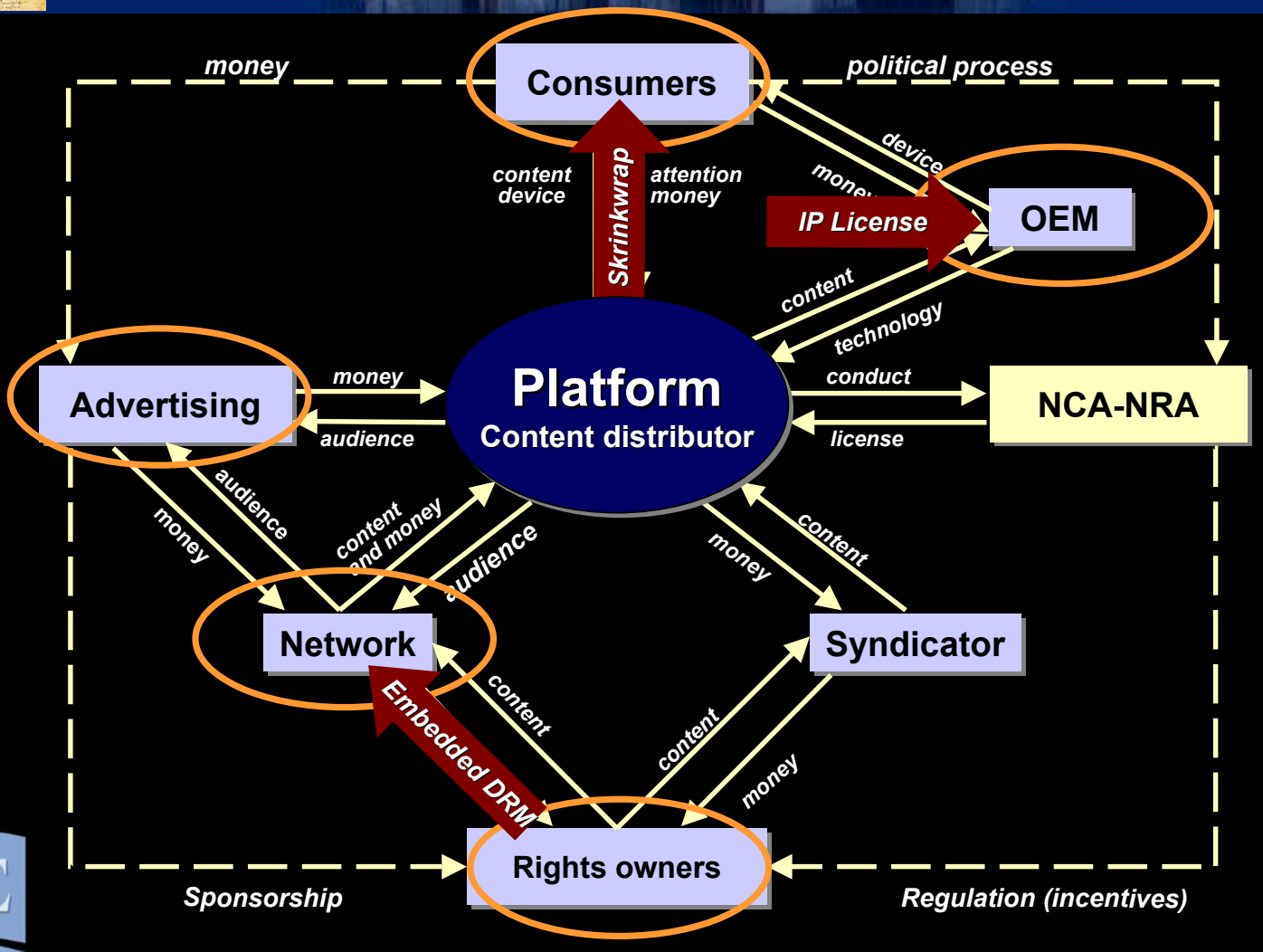
DRM: a holistic view



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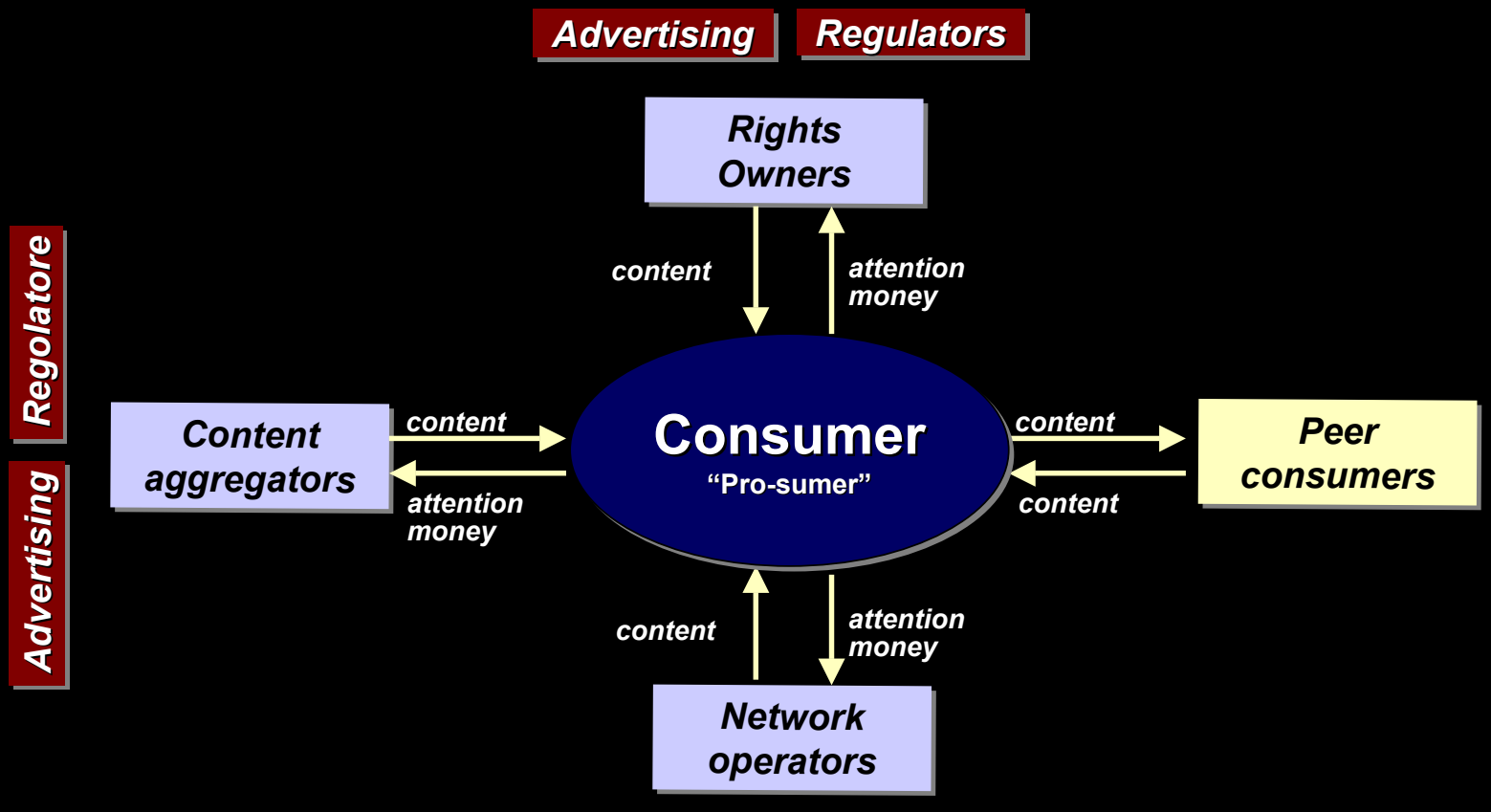
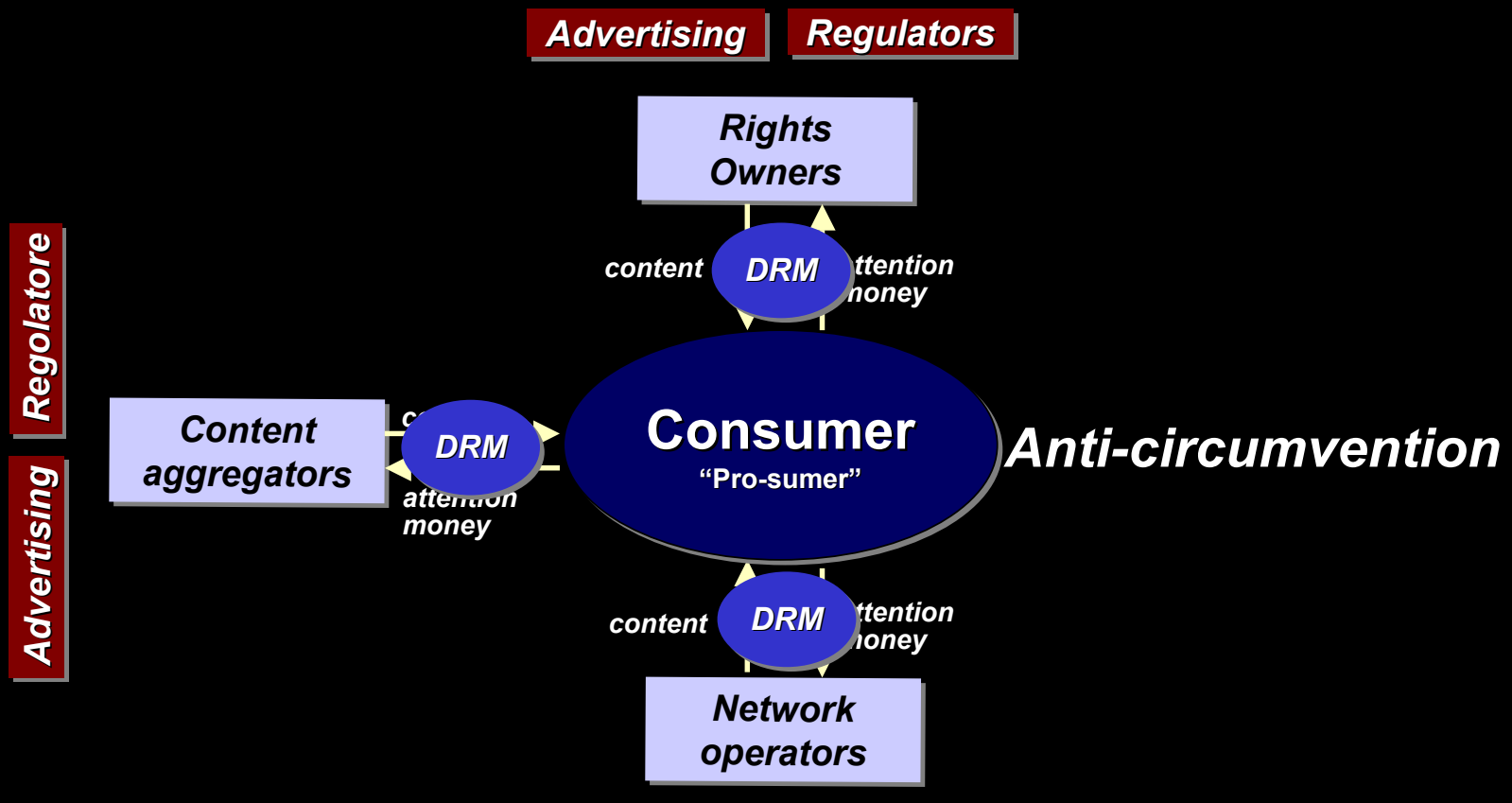
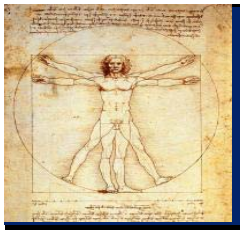
Consumer-centric models and DRM



Consumer-centric models and DRM





The platform operator's Decalogue

"Three Cs": Content, Customers, Capacity

Gather data on customers

Create the product accordingly

→ *Competitive capacity*

<u>Choose system architecture</u>

Create a co-opetition model

Manage customers' expectations

Create the "customer experience"

→ *Business model*

Formulate a pricing/bundling strategy

Versioning strategy

Choose the revenue-mix

→ *Chicken or egg?*

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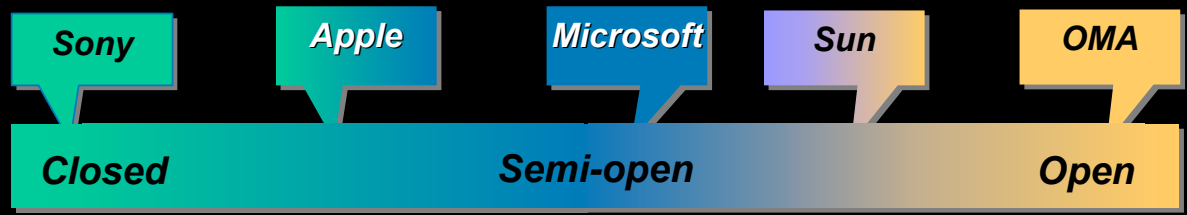
Architectures

The level of interoperability chosen is key for the success of any given platform, especially with converging technologies and business models

Depending on the architectural choice, competition in or for the market will emerge



Proprietary	Open standard
Coordination	Network effects
Inter-system	Intra-system
No Interoperability	Interoperability

No architecture is better than others in all respects. However, with convergence, semi-open models have more chances to prevail

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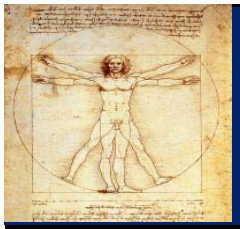

How about market forces?

Most commentators agree that market forces will drive interoperability between devices and more open architectures in the content industry…

- *iTunes is dominant and closed*
  - *System design is the key: losses from songs, profits from devices*
  - *It refused interoperability with VirginMega and with RealNetworks*
  - *Users start to complain*
- *New players are succeeding*
  - *MusicMatch/Yahoo!*
  - *Napster*
  - *Rhapsody*
  - *Sony connect*
  - *Microsoft*
  - *Virgin Digital*
- *The creation of community is increasingly key, and is a major threat to Apple's closed system*

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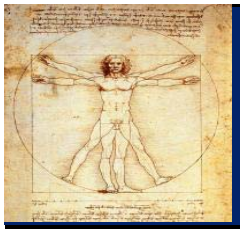

Emerging business models

Legal downloads are increasing – 35% v. 40% illegal downloads. iTunes sold over 400 million songs and earned a 80% market share… is there a market failure?

- *Digital Media Store*
  - *iTunes, Napster, Movielink* DRM *community*
- *P2P Store/Superdistribution*
  - *Wippit, Weedshare, Altnet* DRM *community*
- *Downloads with alternative compensation*
  - *Qtrax* DRM
- *Universal meets Snocap*
  - *All repertoire* DRM *community*
- *Sony meets Snocap and Grokster*
  - *Mashboxx* DRM *community*
- *Collective licensing*
  - *Requires tracking* DRM
- *"Trojan Horse" strategies*
  - *Requires fidelization* *community*

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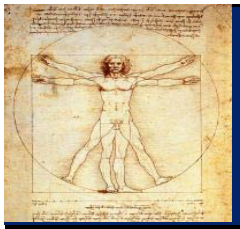

Refusal to grant interoperability?

The four-pronged Magill/IMS test

IP protection in network industries has long relied on the existing Magill rule, which challenges exercise of IP as abusive ex article 82 under "exceptional circumstances"

1. *Did the dominant firm refuse to supply IP-protected information which was indispensable/essential for competitors to effectively compete in a secondary market?*
2. *Assuming it was indispensable, was it indispensable to produce new products/services for which there was an unsatisfied consumer demand?*
3. *Was the allegedly abusive conduct capable of posing a credible threat of eliminating all competition from the secondary market?*
4. *Was the "great refusal" objectively justified?*

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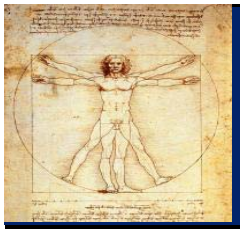

Refusal to grant interoperability?

The US and EU treatment of refusal to grant interoperability by platform operators with integrated system designs are converging towards a deferential approach…

- ***US: "narrow and deferential approach"***
  - ***IBM v. Telex (1993), Innovation data processing (1996), Data Gen. Corp. (1980), Microsoft I (1998)***
    - ***"A court's evaluation of a claim of integration must be narrow and deferential."***
- ***EU: Microsoft Case (2004)***
  - ***Did not fit the Magill/IMS test***
  - ***CFI mandated further analysis on***
    - ***Value of underlying R&D investments***
    - ***Value of the interface information withheld***
    - ***Actual indispensability of the information***
    - ***Merit of protecting Windows' "design concept"***
- ***France: VirginMega v. Apple (November 2004)***
  - ***Lack of interoperability functional to the product's design (system design defense)***

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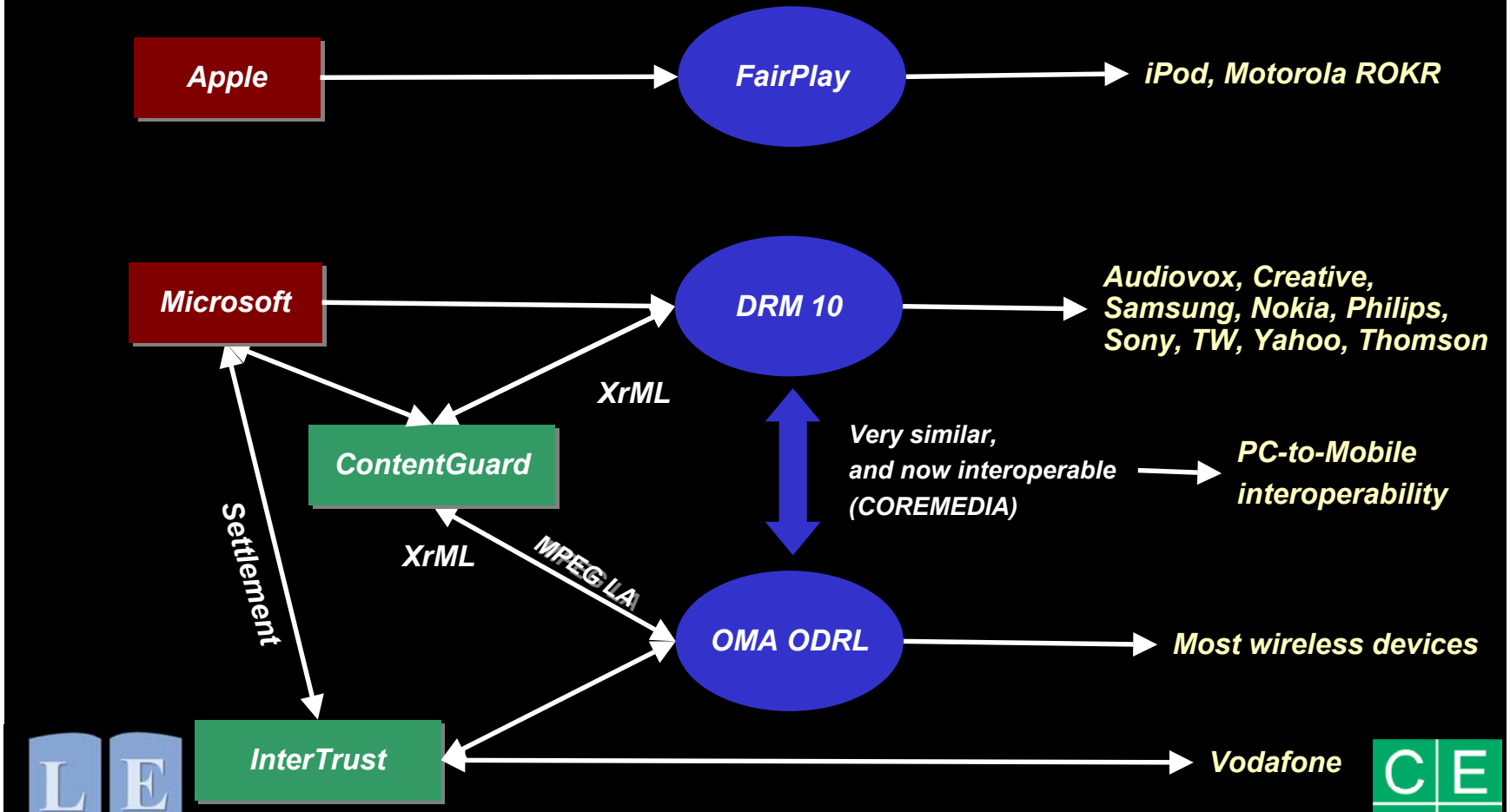
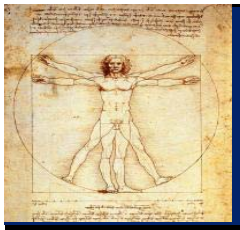
Where patents count





Recommendations

No easy solution exists: only a combination of policies can help facing a combination of TPM, consumer contracts and IP licenses

- ***Antitrust should focus only on enduring bottlenecks***
  - ***Do not change the Magill/IMS rule***
  - ***Do not impose open architectures***
  - ***Deferential approach to system design***
  - ***Focus on enduring bottlenecks in the value chain***
  - ***Focus on more remote layers of the Internet:***
    - ***DRM patents that prevent the creation of new markets***
    - ***Disruption of previous levels of supply***
    - ***Patent tying not functional to system design***
    - ***Unfair practices in patent pools***

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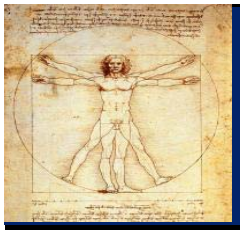

Recommendations

Policymakers in Europe should refrain from picking up winners, and should devote their efforts to creating a level-playing-field

- ***Public policy can create virtuous competition***
  - ***Promote fair licensing systems, but do not impose interoperability***
  - ***Fight exclusive agreements between rights owners and platform operators***
  - ***Promote infrastructure-based competition in the review of e-communications regulation***
  - ***Promote the standardization of usage terms by embedding consumer rights in shrink-wrap contracts***
  - ***Leave platform operators free to choose their own system architecture***
  - ***Use copyright as a safety net***

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All prophets were right!

Code is being promoted, civil disobedience is decreasing, copyright has become an exception, antitrust is confused…

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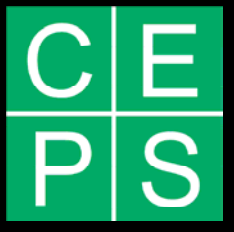

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