

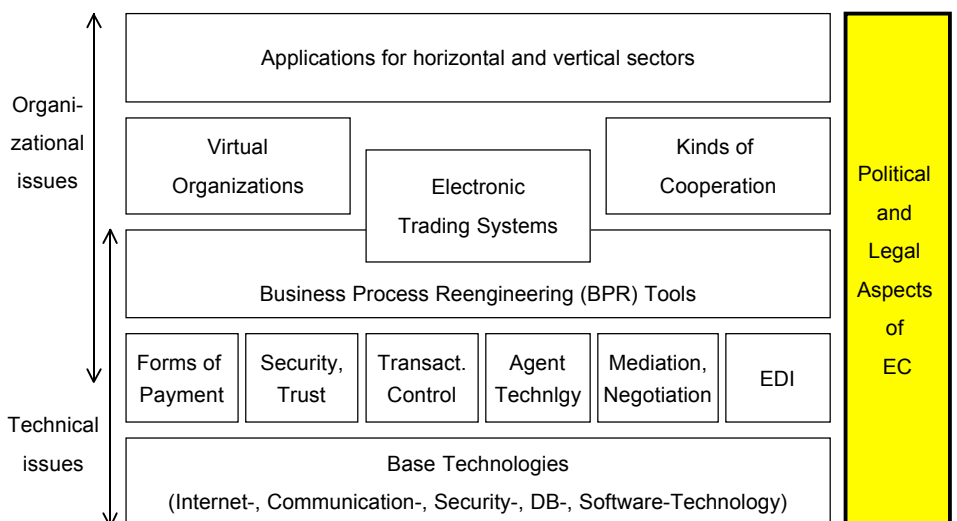
7. Political and Legal Aspects of ECommerce

7.1 Intellectual Property

Types of Intellectual Property, Patents, Trademarks, Copyrights
 Digital Watermarks, Steganography
 Digital Rights Management (DRM)

Goal: Protect Intellectual Property

ECommerce Reference Model



[MeTuLa99]

Intellectual Property (IP) ⁽¹⁾: Types of IP

Disclaimer: Most of the following on Intellectual Property is taken as is from the ECommerce Technology lecture of Peter Wurman, North Carolina State University.

Types of Intellectual Property:

- Inventions:
 - Physical objects or processes
- Original works of authorship:
 - Artistic creations
 - Scientific writings
- Trademarks:
 - Identifications used in business

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IP ⁽²⁾: Well-Known IP Protections

Patent

- Grants the inventor the right to exclude others from making, using, offering for sale, or selling the invention.

Copyright

- Promote science and the “useful arts” by securing for limited times to authors the exclusive right to their work.
- Protects only the form of the expression, not the content.

Trademark

- The right to do business under a particular name/symbol.
- Trademark rights may be used to prevent others from using a confusingly similar mark, but not to prevent others from making the same goods or from selling the same goods or services under a clearly different mark.

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IP (3): IP Protection

Intellectual Property Protection

- Intellectual property protection gives people an incentive to produce creative works.
- Laws and protection vary by country:
 - In Europe, a patent application must be filed before public disclosure
 - In the U.S., a patent application must be filed within one year of public disclosure.

Rough Analogy:

- Patents protect ideas.
- Copyrights protect communications / expressions.
- Trademarks protect (corporate) identity.

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Patents

ECommerce-related patents have been granted for

- Electronic shopping carts (*Open Market*)
- Electronic bill payments (*Open Market*)
- Push technologies (*NetDelivery*)
- 1-click shopping (*Amazon*)
- Reverse auctions (*Priceline*)

Problems with E-business Patents:

- Granted patents have been overly broad
- Granted for obvious technologies
- Business methods can be patented
 - But patents are granted just because the process is automated
- Patenting process takes ~2 years

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Trademarks

Trademarks on the Internet

- Primarily addresses domain names
- Global reach means global confusion
- Long-arm jurisdiction
- Many people think owning a trademark is intellectual property before they have a business identity

Examples:

- eToys.com vs. eToy.com law suit (in 1997)
- Cyber-squatting (“domain-grabbing”) (e.g., www.playstation.com)

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Copyright

The Impact of the Internet: Electronic information

- is exposed to much greater user community
- is easier to copy
- is easier to manipulate

than non-electronic information

Internet permits anonymous actions and allows violations.

Attitudes to Copyrights:

- Information wants to be free
- Information can be shared if attributed
- Limited / fair use (if it doesn't impact the holders revenue)
- Strong copyrights: A work is considered as an “externalization of the author's intention”, and copyright gives author complete control over his works.

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Copyright-related Technologies (1)

Pre-infringement technology

- is enforced before the work is released

Metering technology

- is enforced while the work is available

Post-infringement technology

- is applied after the work has been disseminated

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Copyright-related Technologies (2)

Pre-infringement technologies:

- Limited functionality
- „Date bomb“ (software becomes unusable after a trial period)
- Limited copyability
- Contracts

Metering Technologies:

- Access codes: users pay for a key or a code
- Downloadable executables (download is tracked)
- Copyright clearinghouse (ASCAP, BMI)
- Sale of physical copies

Post-infringement Technologies:

- Software agents / spiders searching for non-licensed material on the web
- Steganography (see below)
- Litigation (legal action)

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Digital Watermark

A **digital watermark** is a pattern of bits inserted into a digital image, audio or video file that identifies the file's copyright information (author, rights, etc.). The purpose of digital watermarks is to provide copyright protection for intellectual property that's in digital format.

Unlike printed watermarks, which are intended to be somewhat visible, digital watermarks are designed to be *completely invisible*, or in the case of audio clips, *inaudible* (The digital watermark should not degrade the information's usefulness).

Moreover, the actual bits representing the watermark must be scattered throughout the file in such a way that they *cannot be identified and manipulated*. And finally, the digital watermark must be *robust* enough so that it can withstand normal changes to the file, such as reductions from lossy compression algorithms.

[Web00]

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Steganography

Steganography is the art and science of hiding information by embedding messages within other, seemingly harmless messages. Steganography works by replacing bits of useless or unused data in regular computer files (such as graphics, sound, text, HTML, or even floppy disks) with bits of different, invisible information. This hidden information can be plain text, cipher text, or even images.

Unlike encryption, steganography cannot be detected. Therefore, it is used when encryption is not permitted. Or, more commonly, steganography is used to supplement encryption. An encrypted file may still hide information using steganography, so even if the encrypted file is deciphered, the hidden message is not seen.

Steganography (literally meaning *covered writing*) dates back to ancient Greece, where common practices consisted of

- Etching messages in wooden tablets and covering them with wax and
- Tattooing a shaved messenger's head, letting his hair grow back, then shaving it again when he arrived at his contact point.

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7-12

Examples: Encoded Information

Information encoded via digital watermarks or steganography:

- License
- Copyright
- Control information
- Authentication
- Tracking
- Fingerprinting: Embed a unique code for each customer, if you find an unlicensed copy, you can identify culprit.

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Detection, Automated Detection and Extraction

Detection:

- Detect the likelihood that a given watermark is present

Automated Detection:

- Spiders can scan images on the web
- Detect copies of an image
- Verify license in registry

Extraction:

- Determine exactly which watermark is present
- Often not possible with robust watermarks

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7-14

Attacking Watermarks

Purpose:

- Render it unreadable
- Reveal its existence
- Confuse the authenticity

Types of Attacks:

- Robustness
 - Remove the watermark
- Presentation
 - Misalign the watermark
- Interpretation
 - Reduce likelihood of mark
- Legal attacks

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Outlook: Digital Rights Management (DRM)

Purpose: Protecting Intellectual Property through the use of encryption and certificates.

Technical idea: The content is encrypted and can only be rendered (shown) by a digital-rights-management aware player.

The DRM player

- contacts the content source to verify the user's license
- verifies that the content is rendered on the licensed user's platform

Rendering of content might imply a payment. Business models are:

- pay-per-use and
- pay once.

Note: Digital Rights Management will be detailed in the lecture Multimedia Content Management (next semester).

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7-16