Software Development, Intellectual Property, and IT-Security

Robert Gehring
TU Berlin
(rag@cs.tu-berlin.de)

Symposium – "Software Related Inventions: Prospects and Risks for European Companies"

Bournemouth University

Computers & Society

The Attitude

«Digital Rights Management (Security). You agree that in order to protect the integrity of content and software protected by digital rights management ("Secure Content"), Microsoft may provide security related updates to the OS Components that will be **automatically downloaded onto your computer**. These security related updates may **disable your ability to copy** and/or play Secure Content **and use other software on your computer**.»

-- MS Security Bulletin MS 02-32

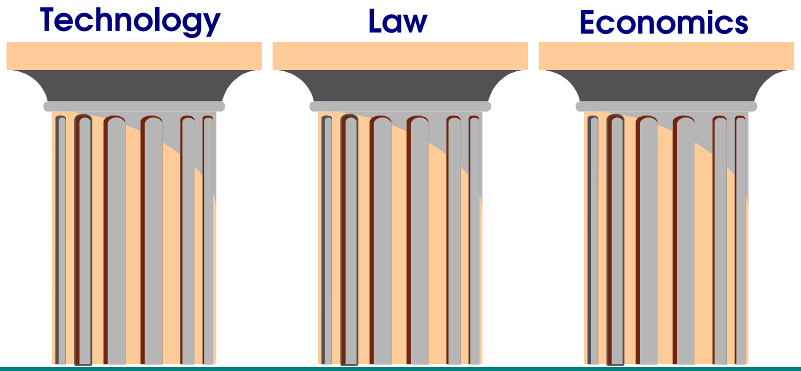
Computers & Society

Highlights from Real Life

- 1999 - "I love you"-virus costs about **US$ 12 billion** (fig. by McAfee 2001)
- 2001 - unreliable software costs U.S. industry about **US$ 78 billion** (CIO Magazine)
- 2002 NIST-study - economic loss of about **US$ 60 billion** due to buggy software

Thesis: Insecurity of Software

«Insecurity of software is due to interaction of technological and legal shortcomings, fostered by economic rationality.»



Computers & Society

Technical Shortcomings (I)

- Incomplete specifications

«(M)odern Systems have so many components and connections - some of them not even known by the systems' designers, implementers, or users - that insecurities always remain.»

-- Schneier 2000: xii

Computers & Society

Technical Shortcomings (II)

- Incomplete testing

«The developers are so in tune with what (the system) should do, they cannot see what it might be able to do.»

-- Pipkin 2000: 75

«In general, it is impractical, often impossible, to find all the errors in a program. This fundamental problem will ... have implications on the economics of testing ...»

-- Myers 1979: 8

Computers & Society

Economic Rationality (I) -
The Vendor(s)

- Profit-seeking and (no) liablity
- Limited service
- Service as a business model

«The revenue of software vendors is predicated on acquiring new customers. That initial sale provides software vendors with their biggest profit. So there is a built-in incentive for vendors to rush a new release of software out the door before it is completely tested and debugged.»

-- Levinson 2001

Economic Rationality (II) - The Customer(s)

- Information asymmetry
- Adverse selection

«Even if consumers are willing to pay for more secure systems, choosing a system based on its security properties is difficult. This is not a failing of the consumer, as even industry experts rarely have little more than crude heuristics available to them to compare the security of competing products.»

-- Schechter 2002: 1

Computers & Society

Economic Rationality (III) - Network Effects

- Proprietary technology preferred by vendor
- Customers forced to use dominant technology

«By keeping its interface proprietary and by providing an exclusive set of applications, a platform owner has some hope of exploiting "network effects" to become a de facto standard in the market.»

-- Samuelson and Scotchmer 2002: 1617

Computers & Society

Legal Obstacles

- Lack of liability
- Trade secret laws
- Intellectual property laws

«Given that risk--taking is being subsidized, it should not be surprising to see the risk level increase.»

-- Lunney 2001: 877

Computers & Society

Copyright Shortcomings

- Ban of reverse engineering/circumvention:
    - Repair is unlawful.
    - Security enhancement is unlawful.
- No liability for *written speech.*

«Encryption and computer security may be crippled if researchers are at risk of liability under the DMCA in the ordinary course of their research.»

-- Samuelson and Scotchmer 2002: 1649

Computers & Society

Patent Law Shortcomings

- Binary distribution is encouraged.
- Compatible products of better security can be blocked.
- Spread of secure technology can be hindered.
- Securing systems can be patented in a *business model patent.*

Computers & Society

How to Improve IT-Security?

- We need an **adequate** risk management strategy.

  The **Open Source (OS) model** may be the right foundation-stone for this strategy.

«Security information about proprietary software often takes longer to develop because only the proprietor has unrestricted access to the code and so the decision of whether to apply resources to security analysis of it is constrained. Opening source permits anyone who cares to apply resources to this task to do so.»

-- Landwehr 2002: 2

Computers & Society

The Strengths of the OSS Model

- Enables **independent** peer review.
- **Adapts copyright** to the specifics of software (gives the right to modify the code).
- Has **short response times** in case of security incidents.
- Furthers **quality transparency** (source code distribution).

Computers & Society

The Patent Threat

- OSS **code open for inspection** (for patent infringement) - binary code not.
- Extensive patent search **requires patent lawyers**.
- **Asymmetric defence conditions** in case of patent litigation (money, patent portfolio).

Computers & Society

Recommendations

- "**Assessment of the law**" with focus on security
- "**Fair use defence**" should be included in patent law

«The use of the source code of computer programs must be granted privileged status under patent law. The creation, offering, distribution, possession, or introduction of the source code of a computer program in its various forms must be exempted from patent protection (source code privilege).»

-- Lutterbeck/Horns/Gehring 2000

Computers & Society

Reference

http://ig.cs.tu-berlin.de/ap/rg/index.html

Computers & Society