IE2022 - Introduction to Cyber Security

Lecture - 11

Legal and Ethical aspects of Information Security

Mr. Amila Senarathne

Topics to be discussed

* Program and data protection by patents, copyrights, and trademarks

* Computer crime

* Ethical analysis of computer security situations

* Codes of professional ethics

References

* Security in Computing - Legal and Ethical Issues in Computer Security
* Other related materials

Data Acquisition

* Data acquisition is the process of obtaining data from a digital device using peripheral equipment and media.

* There are two types of acquisition;
  - Static acquisition
  - Live acquisition

Law and Computer Security

* International, national, state, and city laws can affect privacy and secrecy

  – These statutes often apply to the rights of individuals to keep personal matters private.

* Laws regulate the use, development, and ownership of data and programs

  – Patents, copyrights, and trade secrets are legal devices to protect the rights of developers and owners of programs and data.

* Laws affect actions that can be taken to protect the secrecy, integrity, and availability of computer information and service

Challenges

* Law does not always provide an adequate control

* Laws do not yet address all improper acts committed with computers

* Some judges, lawyers, and police officers do not understand computing, so they cannot determine how computing relates to other, more established, parts of the law

* Lack of technical expertise of legal personnel

Protecting Programs and Data

* Common legal devices include:
    - Copyrights
    - Patents
    - Trade Secrets

* Copyrights, patents, and trade secrets are legal devices that can protect computers, programs, and data. However, in some cases, precise steps must be taken to protect the work before anyone else is allowed access to it.

Sri Lankan Context

* INTELLECTUAL PROPERTY ACT, No. 36 OF 2003
  - The **National Intellectual Property Office** of **Sri Lanka** established under the **Intellectual Property Act** No 36 of 2003 is mandated with the administration of the **intellectual Property** System in **Sri Lanka**.
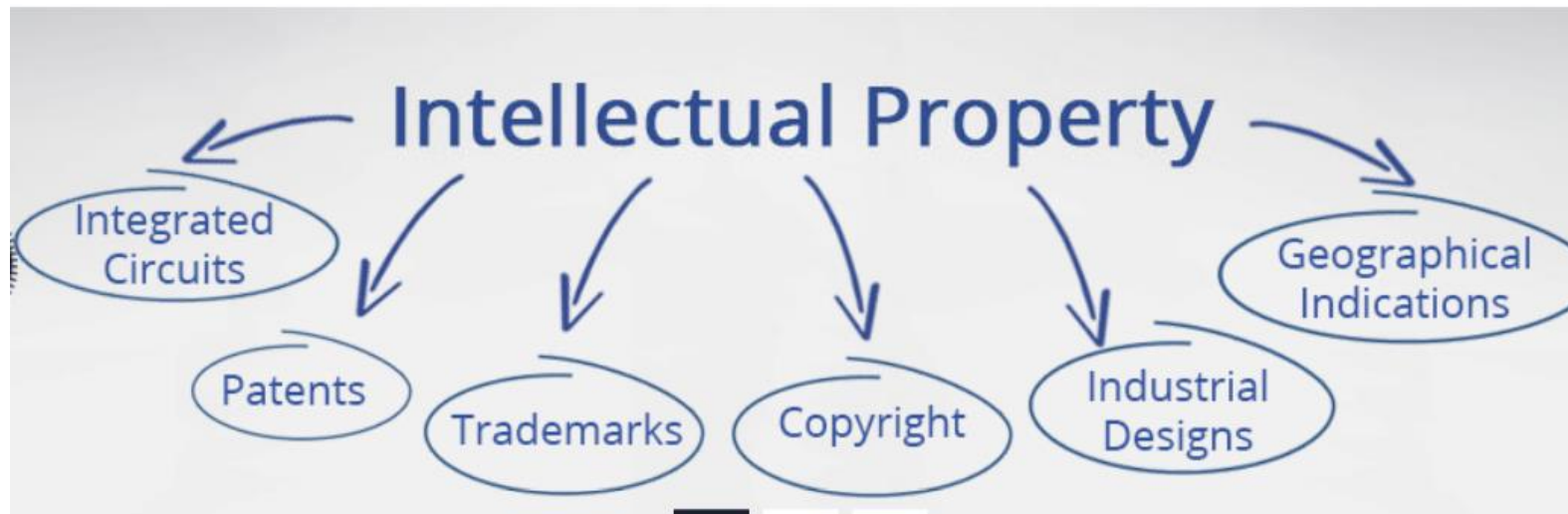
World Intellectual Property Organization

* WIPO is one of the 15 specialized agencies of the United Nations (UN).

* WIPO was created in 1967 "to encourage creative activity, to promote the protection of intellectual property throughout the world"

* WIPO currently has 192 member states, administers 26 international treaties

* Headquartered in Geneva, Switzerland.

Copyrights

* Designed to protect the expression of ideas
  - Copyright applies to a creative work, such as a book, story, photograph, song, or pencil sketch. The right to copy an expression of an idea is protected by a copyright.
* Ideas are free but once expressed (in a tangible medium) must be protected
* Intention of a copyright is to allow regular and free exchange of ideas
  - The law protects an individual's right to earn a living, while recognizing that exchanging ideas supports the intellectual growth of society.
* Gives the author the exclusive right to make copies of the expression and sell them to the public
  - copyright law also has the concept of a first sale; after having bought a copyrighted object, the new owner can give away or resell the object

Copyrights

* Copyright must apply to original work
* It lasts for few years after which it is considered public domain
* Copyright object is subject to fair use
* Product used in a manner for which it was intended and does not interfere with the author's rights, e.g. comment, criticism, teaching, scholarly research
* Unfair use of copyrighted object is called piracy

Copyrights

* A U.S. copyright now lasts for 70 years beyond the death of the last surviving author, 95 years after the date of publication for organizations

* The international standard is 50 years after the death of the last author or 50 years from publication
  – World Intellectual Property Organization treaty of 1996, an international copyright standard to which lot of countries adhere.

* Duration of copyright in Sir Lanka
– Lifetime of the author and for a further period of 70 years from the date of his death (p.m.a.); a work of applied art is protected for 25 years from the date of the making of the work.

Copyrights for Computer Software

✴ Computer program can be copyrighted (depending on the law of the county)

✴ Copying the code intact is prohibited

✴ Challenge 1

– Algorithm is the idea, and the statements of the programming language are the expression of the idea

– Protection is allowed for the program statements themselves, but not for the algorithmic concept

– Copying the code intact is prohibited, but re-implementing the algorithm is permitted

Copyrights for Computer Software

✴ Challenge 2

– copyright protection for computer works is the requirement that the work be published.

– A program may be published by distribution of copies of its object code, for example, on a disk. However, if the source code is not distributed, it has not been published.

– An alleged infringer cannot have violated a copyright on source code if the source code was never published.

Digital Millennium Copyright Act of 1998

✴ The Digital Millennium Copyright Act (DMCA) is a 1998 United States copyright law that implements two 1996 treaties of the World Intellectual Property Organization (WIPO).

– Digital objects can be subject to copyright

– It is a crime to circumvent or disable antipiracy functionality built into an object

– It is a crime to manufacture, sell, or distribute devices that disable antipiracy functionality or that copy digital objects

Digital Millennium Copyright Act of 1998

* However, these devices can be used (and manufactured, sold, or distributed) for research and educational purposes

* It is acceptable to make a backup copy of a digital object as a protection against hardware or software failure or to store copies in an archive

* Libraries can make up to three copies of a digital object for lending to other libraries

* Problems is deciding what is considered piracy
    – Example, how do you transfer music from your CD to MP3 which is considered a reasonable fair use?

Patents

* Patent Office must be convinced that the invention deserves a patent
* Patents were intended to apply to the results of science, technology, and engineering
  – whereas copyrights were meant to cover works in the arts, literature, and written scholarship. (distinction between patents and copyrights)
* A patent can be valid only for something that is truly novel or unique – usually one patent for a given invention
* Patent law has expanded to include computer software
  – Recognizing that algorithms, like processes and formulas, are inventions.

Patent Infringement

* Copyright: holder can decide which violations prosecute
* Patent: all violations must be prosecuted or patent can be lost
* Suing for patent infringement may cause the patent owner to loose the paten. Infringer may argue that:
  - This isn't infringement (different inventions)
  - The patent is invalid (a prior infringement was not opposed)
  - The invention is not novel
  - The infringer invented the object first

Applicability of Patents to Computer Objects

* Patent law has expanded to include computer software
  - Recognizing that algorithms, like processes and formulas, are inventions.
* Patent Offices have issued thousands of software patents
* One of the most desired protection for software with value algorithms to protect
* Because of the time and expense involved in obtaining and maintaining a patent, this form of protection may be unacceptable for a small-scale software writer.

Trade Secrets

* A trade secret is information that gives one company a competitive edge over others

* Unlike a patent or copyright it must be kept a secret
  – Employees should not disclose secrets
  – Owners must protect the secrets
  – File encryption
  – Make employees sign a statement not to disclose a secret

Trade Secrets : Applicability to Computer Objects

✳ Trade secret protection allows distribution of the result of a secret (the executable program) while still keeping the program design hidden

✳ It does not cover copying a product (specifically a computer program)

✳ It makes it illegal to steal a secret algorithm and use it in another product

✳ If someone obtains it improperly, the owner can recover
  – Profits
  – Damages
  – Lost revenues
  – Legal cost

Trade Secrets: Applicability to Computer Objects

* Applies very well to computer software (can protect the algorithm as a secret)

* Difficulty with computer programs is that reverse engineering works.
  - Decompiler and disassembler programs can produce a source version of an executable program.

* Enforcement Problems

* Does not help if program/code is decoded – trade secret protection disappears
  - Additional protection/safeguards is needed
  - Make copies of sensitive documents
    * Control access to files
    * Non-disclosure agreements

Copyright, Patent and Trade Secrets

	Copyright	Patent	Trade Secret
Protects	Expression of idea, not idea itself	Invention—the way something works	A secret, competitive advantage
Protected object made public	Yes; intention is to promote publication	Design filed at Patent Office	No
Requirement to distribute	Yes	No	No
Ease of filing	Very easy, do-it-yourself	Very complicated; specialist lawyer suggested	No filing
Duration	Life of human originator plus 70 years, or total of 95 years for a company	19 years	Indefinite
Legal protection	Sue if unauthorized copy sold	Sue if invention copied	Sue if secret improperly obtained

Protecting Computer Objects

* Hardware
  - Patented

* Firmware – Chips and microcode
  - Patented
  - Data (algorithms, instructions and programs inside it) are not patentable
  - Trade secret – for code inside chip

* Object Code Software
  - Copyrighted

Protecting Computer Objects

* Source Code Software
  – Trade secret
  – Copyrighted

* Documentation
  – Copyrighted

* Web Content
  – Copyrighted

Computer Crime

✳ Computer crime (Cybercrime) is defined as a crime where a computer is the object of the crime or is used as a tool to commit an offense.

✳ Least clear area of law in computing

✳ Separate category for computer crime
  – No access to the physical object → Is it a serious crime?
  – Rules of evidence → How to prove the authenticity?
  – Threats to integrity and confidentiality → How to measure loss of privacy?
  – Value of data → How to measure it?

Why a Separate Category for Computer Crime Is Needed

* Law regarding crimes involving computers are less clear
* New laws needed to address these problems
* Rules of property
  – Unauthorized access to a computing system is a crime
  – Problem is access by a computer does not involve physical object so may not be punishable crime
* Rules of Evidence
  – Courts prefer an original source document to a copy
  – Copies may be inaccurate or modified
  – Problem with computer-based evidence in court is being able to demonstrate the authenticity of the evidence

Copyrights

* Copyright must apply to original work

* It lasts for few years after which it is considered public domain

* Copyright object is subject to fair use

* Product used in a manner for which it was intended and does not interfere with the author's rights, e.g. comment, criticism, teaching, scholarly research

* Unfair use of copyrighted object is called piracy

Copyrights

* A U.S. copyright now lasts for 70 years beyond the death of the last surviving author, 95 years after the date of publication for organizations

* The international standard is 50 years after the death of the last author or 50 years from publication
  – World Intellectual Property Organization treaty of 1996, an international copyright standard to which lot of countries adhere.

* Duration of copyright in Sir Lanka
– Lifetime of the author and for a further period of 70 years from the date of his death (p.m.a.); a work of applied art is protected for 25 years from the date of the making of the work.

Questions ?

SLIIT
FACULTY OF COMPUTING

THANK YOU