Copyright & Ethics on the Web – Issues for the Software Engineering Educator

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Abstract

Most educators are familiar with copyright and fair use practices. However, there are new considerations for copyright and fair use on the web. Software engineering educators need to become aware of the new laws pertaining to copyright. The 1996 Telecommunications Act and the 1998 Digital Millenium Act are important for their implications for copyright. In addition, software engineering educators need to be aware of laws pertaining to access, privacy and accessibility when providing course material on the web. These issues are extremely important for not only copyright issues, but also for personal privacy issues. The new emerging technologies affect how we teach and what we are doing with our materials is important for all educators to know.

Copyright and the Law

Most laws are based on either federal law or non-federal law. Laws based upon the U.S. Constitution include copyrights and patents. Laws based upon other federal statutes include trademarks. Laws not based on federal law include trade secrets and codes of ethical conduct. All of these areas include important information for software engineers and educators. This paper will concentrate on information pertaining to copyright and codes of ethical conduct.

Software engineering educators need to be aware that laws pertaining to property are broken up into types of property including real property, personal property and intellectual property. Federal courts have jurisdiction over the sciences and the arts. In particular the federal courts hear cases pertaining to copyrights, patents and trademarks.

Copyright

As defined by Ballentine's Law Dictionary copyright is “the exclusive privilege, by force of statute, of an author or proprietor to print or otherwise multiply, publish, and vend copies of his literary, artistic, or intellectual productions, and to license their production and sale by others during the term of its existence.” Copyright is covered by Title 17 of the United States Code. The original Copyright Act of 1976 included several provisions. Copyright grants six specific rights to owners:

1) the right to reproduce the work;
2) the right to prepare derivative works based upon the original;
3) the right to distribute copies (by sales or other means);
4) the right to perform the work publicly;
5) the right to display the work publicly; and
6) the right, in the case of sound recordings, to perform the copyrighted work publicly by means of a digital audio transmission.

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Categories of copyright include: literary works; musical works, including words; dramatic works, including music; pantomimes and choreographic works; pictorial, graphic and sculptural works; motion pictures and audiovisual works; and sound recordings.

Unprotected items include ideas, procedures, processes, systems, and methods of operation, concepts, discoveries, public domain material, titles of works and facts. The time limits of copyright protection are the life of the author plus 50 years, or for works for hire—75 years.

Damages for infringement include 1) injunction to prevent or restrain the violator from continuing their practice; 2) impounding or destruction of copied articles; 3) recovery of actual damages; 4) recovery of profits from infringer; and 5) attorney and statutory damages if copyright registered prior to date of infringement. [2,3]

Many software engineering educators do not realize what in the software field is covered under copyright law. Source code and object code are both copyrightable. Operating systems are copyrightable. Look and feel is copyrightable. Databases are copyrightable as compilations, however we need to distinguish between new and preexisting material in the database. Program documentation, including design documents (flowcharts, detailed specifications), user manuals, comments is also included. [4]

**Fair Use**

One of the most complicated areas of copyright is the Fair Use doctrine. This concept was written into the original Copyright Act of 1976. Fair use involves the usage of copyrighted material for private, nonprofit purposes. [1] Fair use criteria includes four areas:

1. the purpose and character of the use, including whether such use is of a commercial nature or is for nonprofit educational purposes;
2. the nature of the copyrighted work;
3. the amount and substantiality of the portion used in relation to the copyrighted work as a whole; and
4. the effect of the use on the potential market for or values of the copyrighted work.

Software engineering educators need to be aware of the areas that are covered under the fair use doctrine. Classroom display and short-term copying are normal exceptions to copyright law. There are two primary education exemptions: 1) exempts from infringement liability the performance or display of a copyrighted work in the course of face-to-face teaching activities by a non-profit educational institution in a classroom or similar setting; 2) exempts from liability the transmission of a performance or display of a copyrighted work if (1) the performance or display is a regular part of the systematic instructional activities of the non-profit educational institution; (2) the performance or display is directly related and of a material assistance to the teaching content of the transmission; and (3) the transmission is made primarily for reception in classrooms or similar places or by persons to whom the transmission is directed because of their disabilities. [12]

As the doctrine of fair use was used Congress asked that interested parties form committees to develop guidelines for the permissible educational and library uses of copyrighted material. These guidelines set minimum (or “safe harbor”) standards for fair use. These have won general congressional endorsement and wide acceptance. The following are accepted guidelines for classroom copying with respect to books and periodicals. [10]

I. Single copy for teachers may be made of:
   A. A chapter from a book;
   B. An article from a periodical or newspaper;
C. A short story, short essay, or short poem, whether or not from a collective work;
D. A chart, graph, diagram drawing, cartoon or picture from a book, periodical, or newspaper.

II. Multiple copies for classroom use (not to exceed 1 copy per pupil) provided that:
   A. The copying meets tests of brevity and spontaneity (defined below);
   B. The copying meets the cumulative effect test (as defined below);
   C. Each copy includes a notice of copyright

Brevity tests are:
   1. Poetry – 1 complete poem if less than 250 words (and printed on not more than 2 pages); or an excerpt from a longer poem of not more than 250 words;
   2. Prose – a complete article, story or essay of less than 2,500 words; or an excerpt of not more than 1,000 words or 10% of the work, whichever is less, but a minimum of 500 words;
   3. Illustrations – one chart, graph, diagram, drawing, cartoon or picture per book or per periodical issue;
   4. Special works – combined works with prose, illustrations may not be reproduced in their entirety; however not more than two pages containing not more than 10% of the work may be reproduced.

Spontaneity tests are:
   1. The copying is at the instance and inspiration of the individual teacher; therefore
   2. The inspiration and decision to use the work and moment of its use for maximum teaching effectiveness are so close that it would be unreasonable to expect a timely reply to a request for permission.

Cumulative Effect tests are:
   1. The copying of the material is for only one course in the school in which the copies are made;
   2. Not more than one short poem, article, story, essay or two excerpts may be copies from the same author, nor more than three from the same collective work or periodical volume during one class term; and
   3. There shall not be more than nine instances of such multiple copying for one course during one class term. [11]

There is a whole set of additional guidelines for educational uses of music, which are not covered here on the Internet site: www.musiclibraryassoc.org/Copyright/guidemus.htm. Other guidelines include Off-Air Recordings of Broadcast Programming for Educational Purposes.

**Ten Big Myths About Copyright**

Brad Templeton, Chairman of the Board of the Electronic Frontier Foundation has come up with 10 myths concerning fair use. [8] The 10 myths are:
   1. If it doesn’t have a copyright notice, it’s not copyrighted.
   2. If I don’t charge for it, it’s not a violation.
   3. If it’s posted to Usenet it’s in the public domain.
   4. My posting was just fair use!
   5. If you don’t defend your copyright you lose it.
   6. If I make up my own stories, but base them on another work, my new work belongs to me.
   7. They can’t get me, defendants in court have powerful rights.
8. Oh, so copyright violation isn’t a crime or anything.
9. If doesn’t hurt anybody, in fact it’s free advertising.
10. They emailed me a copy, so I can post it.

Educators need to be aware that almost everything is copyrighted the moment they are written, and no copyright notice is required. We need to be careful that when we post on the internet that copyright is not ignored. Be very aware that usual postings of e-mails you receive is a violation of copyright, but quoting from an e-mail is not. It is up to each software engineering educator to stay aware of updates and changes in copyright and fair use law.

**The CONFU (Conference on Fair Use)**

With the growth of various digital technologies, the Conference on Fair Use (CONFU) was established in 1994 to help create new guidelines for the fair use of electronic media for educational and library use. Only the working groups for multimedia and computer software got beyond any draft stage. In 1997 CONFU released the Fair Use Guidelines for Education Multimedia. The guidelines given were to clarify the application of fair use as teaching methods adapted to learning environments. These included multimedia projects that combined several copyright protected elements. Use of multimedia programs are permitted for 1) students; 2) educators (their own projects) for (a) face-to-face instruction; (b) for students directed self-study; and (c) for remote instruction enrolled in curriculum-based courses and located at remote sites as long as the access is limited on the network and the technology prevents the making of copies of copyrighted material; (if the network isn’t secure, students or educators may use the multimedia projects for a period of only 15 days after its initial real-time remote use in the course of instruction or 15 days after its assignment for directed self-study. After that, one of two use copies may be placed on reserve in a learning resource center, library or similar facility for students enrolled in the class.) and (d) educator use for peer conferences and educator use for professional portfolios. [3]

There are several limitations for time and amount for multimedia projects. The following apply to the guidelines:

1. Time limitations – a period of up to 2 years after first instructional use.
2. Portion limitations – these are the aggregate amount in the copyright work:
   a. motion media – up to 10% or 3 minutes whichever is less
   b. text – up to 10% or 1000 words whichever is less; an entire poem of less than 250 words, but no more than 3 poems by one poet, or five poems by different poets from any anthology; excerpts may be up to 250 words
   c. music, lyrics and music video – up to 10% but no more than 30 seconds from an individual work
   d. illustrations and photographs – may be used in entirety, but no more than 5 images by an artist; from a collective work no more than 10% or 15 images whichever is less may be reproduced
   e. numerical data sets – up to 10% or 2500 fields or cell entry, whichever is less from a database or data table
3. Copying and distribution limitations – no more than 2 copies may be made of an educator’s educational project. [12]

As mentioned previously, it is up to the educator to keep abreast of pertinent laws pertaining to classroom and multimedia projects.
The Digital Millennium Copyright Act

As lawmakers and courts dealt with the area of copyright, it became very clear that new digital technologies created problems with the original 1974 Copyright Act. The courts needed a law that made the technology “neutral”. In 1993 the National Information Infrastructure created an Intellectual Property Working Group to discuss the concepts of intellectual property within a digital environment. This was under the auspices of the Patent and Trademark Office and Department of Commerce. In 1994 various focus group meets were help across the country to fine tune the 1976 Copyright Act. At the end of 1995 a White Paper was proposed concerning communications across telecommunication resources be released. From these meetings came the Telecommunications Reform Act of 1996. After this time the World Intellectual Property Organization met to discuss several areas of intellectual property and the law. From these meetings came the Digital Millennium Copyright Act of 1998. This act addressed areas of browsing, caching, linking, downloading, RAM and storage. The act also addressed fair use for educational institutions and libraries. It also addressed the responsibility and liability of internet service providers. [7,9]

The Technology, Education, and Copyright Harmonization Act of 2001

Within the Digital Millennium Copyright Act there is a provision dealing with distance education that recommends that the Register of Copyrights submit to Congress recommendations on how to promote distance education through digital technologies. In March 2001, the Senate introduced the Technology, Education, and Copyright Harmonization Act of 2001, also known as the TEACH Act. The act “extends the exemption from infringement liability for instructional broadcasting to digital distance learning or distance education” and “allows under specified conditions the performance and display of reasonable and limited portions of any copyrighted work in an amount comparable to that which is typically displayed in the course of a live classroom session, by or in the course of a transmission.” (Bill summary) This act will help distance learning classes have the same copyright and intellectual property protections as traditional classroom settings. [9]

Registering a Copyright

Copyright Act affords each author protections just for creating a work. However, it may be advisable to officially register your work with the U.S. Copyright Office. The reasons for registering your copyright are to give you the ability to sue, and to collect statutory damages. If you register your work within three months from the date of first publication, or at least prior to the infringement, you may collect statutory damages for up to $100,000, plus attorney fees and court costs. You may download the copyright from the web site www.benedict.com/info/forms/forms.asp. The steps in registering are as follows: 1) determine your classification you want the work to be registered under; 2) determine who owns the work you wish to register; 3) select the proper copyright form based upon the classification of the work, including the proper deposit required; 4) fill in the form, include the filing fee ($30.00), proper deposit and registration fee to the U.S. Copyright Office. [4,14,15,16]

Ethics on the Web

Software Usage

As the new digital technologies increase the amount of people creating and using software, users need to be aware of ethical standards concerning software usage. One consortium of colleges and universities committed to the use and management of information technology in
higher education is EDUCOM. They have worked closely with the Information Technology Association of America (ITAA) to create information for educators. These two groups have made it clear that “because electronic information is volatile and easily reproduced, respect for the work and personal expression of others is especially critical in computer environments.” They classify software into four broad categories – (1) commercial, (2) shareware, (3) freeware, and (4) public domain. Commercial software is purchased from software vendors, publishers, etc. You are actually licensing the use of the software when you buy it. Shareware is covered by copyright. Again, you are acquiring a license to use the software, not own it. You may make copies and distribute them for testing, but after testing, if you adopt it for use, you must pay for it. Freeware is also covered by copyright, but copies can be made (but not for profit), modifications can be made, decompiling is allowed and development of new works based on the package is encouraged. Public Domain software is when the original copyright holder explicitly relinquishes all rights to the software. Therefore, copies may be made, modifications are allowed, decompiling is allowed and development of new works is allowed without conditions.

Ernest Kallman in his book believes that there are four choices each computer user and professional can make concerning ethics and law. First, a decision may be ethical and legal (such as buying a computer for each employee). Second, a decision may be ethical but not legal (such as making a backup copy even if the agreement does not allow this). Third, a decision may be not ethical but legal (such as not citing sources in a research paper). Fourth, a decision is not ethical and not legal (such as making unauthorized copies of software). [5]

**Ethical Codes of Conduct**

In addition, many professional organizations, such as the Software Engineering Institute (SEI) of Carnegie Mellon has created or endorsed standards of ethical conduct. [5] Such standards include both personal and professional codes. The IEEE-CS/ACM Joint Task Force on Software Engineering Ethics and Professional Practices has recommended the Software Engineering Code of Ethics and Professional Practice. It includes eight sections including (1) Public; (2) Client and Employer; (3) Product; (4) Judgement; (5) Management; (6) Profession; (7) Colleagues; and (8) Self. The Association for Computing Machinery (ACM) has also a Professional Code of Ethics. [18,21]

The Computer Ethics Institute has created The Ten Commandments of Computer Ethics.

1. Thou shalt not use a computer to harm other people.
2. Thou shalt not interfere with other people’s computer work.
3. Thou shalt not snoop around in other people’s computer files.
4. Thou shalt not use a computer to steal.
5. Thou shalt not use a computer to bear false witness.
6. Thou shalt not copy or use proprietary software for which you have not paid.
7. Thou shalt not use other people’s computer resources without authorization or proper compensation.
8. Thou shalt not appropriate other people’s intellectual output.
9. Thou shalt think about the social consequences of the program you are writing or the system you are designing.
10. Thou shalt always use a computer in ways that insure consideration and respect for your fellow humans. [20]

All of these organizations ascribe to sets of ethical standards of behavior. Software engineering educators need to know these various codes themselves and teach them to their students.
As software engineering educators teach in the new millenium they need to be aware of all of the new laws and codes of conduct so that they may share this information with their students and be examples of proper behavior.

References


Internet Sites

[22] http://www.ccsr.cse.dmu.ac.uk/discussion
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