Copyrights for software in the Digital Era

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Rights in Digital Age

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CONTENTS

ABSTRACT

In this digital age, internet has made all information readily available to anyone who is willing to look for it. With advent of new technologies in the cyber world, the ever drastically revised copyright law is still unable to address the issues that are newly rising. New digital system provides new means for infringements, increased difficulty in detecting an infringement. This is narrowing the copyright protection for programs and software. This arises the question if the current copyright laws offer sufficient protection to works created using new and arising technologies.

INDEX TERMS

Copyright, Infringement, Programs.

I. INTRODUCTION

With major advances in digital technologies, the frequently amended copyright law is unable to keep pace with rising issues. The most common issues arise due to the digital storage and transmission of works. The ease of creation, reproduction, storage and distribution of copyrighted works have major implications on current copyright laws. The ability of authors to express their works in newer mediums and platforms make it challenging to preserve their copyrights. All these coupled with the merger doctrine and fair use, greatly undermines the copyright law, making it harder for the law to be enforced and gain public acceptance. This narrows down the scope for protection of present works by copyright laws. One of the best scenarios where we see this being applied in software is the Google LLC v Oracle America, Inc, case where Oracle files a case against Google claiming that Google infringes the copyright on JAVA APIs. [1]

II. LITERATURE REVIEW

A. Copyright

Copyright is a type of intellectual property that gives its owner the exclusive right to copy and distribute a creative work, usually for a limited time. [2]

17 U.S.C §102 (a) states that any original work of authorship that is fixed in any tangible medium of expression, now known or later developed, which can be perceived, reproduced or communicated directly or with the help of a device or machine is eligible for copyright protection.

The work of authorship comprise of the following categories:

1) literary works;
2) musical works, including any accompanying words;
3) dramatic works, including any accompanying music;
4) pantomimes and choreographic works;
5) pictorial, graphic, and sculptural works;
6) motion pictures and other audiovisual works;
7) sound recordings; and
8) architectural works.

17 U.S.C §102 (b) clarifies that idea, procedure, process, system, method of operation, concept, principle, or discovery, can not be awarded copyright protection regardless of how they are expressed.

When an author is given copyright for his work, he is granted exclusive privileges under **17 U.S.C §106**

1) to reproduce the copyrighted work in copies or phonorecords
2) to prepare derivative works based upon the copyrighted work
3) to distribute copies or phonorecords of the copyrighted work to the public by sale or other transfer of ownership, or by rental, lease, or lending
4) in the case of literary, musical, dramatic, and choreographic works, pantomimes, and motion pictures and other audiovisual works, to perform the copyrighted work publicly
5) in the case of literary, musical, dramatic, and choreographic works, pantomimes, and pictorial, graphic, or sculptural works, including the individual images of a motion picture or other audiovisual work, to display the copyrighted work publicly
6) in the case of sound recordings, to perform the copyrighted work publicly by means of a digital audio transmission.

B. Fair use

The works of authors for purposes such as criticism, comment, news reporting, teaching, scholarship, or research, does not infringe its copyright. **17 U.S.C §107** states the factors to be considered for fair use of of a work to be:

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 upon the potential market for or value of the copyrighted work.

[4]

C. Merger Doctrine

Merger Doctrine is a principle of copyright law which says when there is only one or limited number of ways to express an idea, copyright law will not protect the expression because it has ”merged” with the idea. [3]

D. Naruto et al v. David Slater

A seven-year-old crested macaque named Naruto, allegedly took several photographs of himself with a camera left unattended by a wildlife photographer, David Slater. The Monkey Selfies were published in a book that Slater created through Blurb, Inc.’s (”Blurb”) website. In 2015 People for the Ethical Treatment of Animals (”PETA”) and Dr. Antje Engelhardt filed a complaint for copyright infringement against Slater, Wildlife, and Blurb, as Next Friends on behalf of Naruto. This gave raise to a major question if a monkey sue humans, corporations, and companies for damages and injunctive relief arising from claims of copyright infringement? The court said that the Copyright Act did not expressly authorize animals to file copyright infringement suits and thus, based on precedent, Naruto lacked statutory standing to sue under the Copyright Act. [17]

III. Research Methodology

In order to understand the current protection offered by copyright laws to software, we visit and review significant cases in the domain.

A. Significant cases

The factors for copyright eligibility for implementations of programming language, specifically instances where the functionality is popular enough to be copied off are to be determined. The following are specific cases are considered:

1) Copyrightablility of software interfaces:

Software interfaces are the most fundamental components in any software. To a layman, it is what they perceive. Under such circumstances, the external interface can be an critically identifying component of any software system. In the Lotus Development Corp. v. Borland International, we see if software interfaces are copyrightable.

Lotus Development Corp. v. Borland International (1990)

Claim: Lotus claimed that the menu hierarchy present in the user interface of Lotus-1-2-3 has been copied by Borland for their products.

Lotus the plaintiff, marketed Lotus-1-2-3, a computer spreadsheet program that has several menu commands as well as the option to create macro commands (run a series of commands using single key stroke).After which Borland, the defendant, released Quattro and Quattro Pro, 2 versions of its own spreadsheet program that has menu trees identical to that of the Lotus-1- 2-3. Borland did not copy the underlying code for the menu but only the functionalities to make it easier for the consumers familiar with Lotus' macro to use its spreadsheet program.

United States District Court for the District of Massachusetts: ruled in favor of the plaintiff, said that the defendant could have redesigned the menu.

United States Court of Appeals for the First Circuit: menu is a "method of operation", making it uncopyrightable. [5], [6]

2) Program Module Cloning:

When lawsuits are filed based on copying interfaces, it usually revolves around the underlying code being reproduced without having access to the original. But what if the the code is being used for commercial purpose directly copied? We see this in the recently concluded Google LLC v. Oracle America, Inc. case.

Google LLC v. Oracle America, Inc.

Claim: Google for infringed the copyright that Oracle had on their Java API by copying about 11,500 lines of code from the Java SE program.

Google implemented its own Operating System - Android Operating System (Android OS), using its own programming language based on the programming language Java which is owned by Oracle. Due to the general familiarity with Java programming language, Google's version used the same names, organization, and functionality as Java's Application Programming Interfaces (APIs).

Federal district court: APIs are not subject to copyright. Permitting a private entity to own the copyright to a programming language would stifle innovation and collaboration, contrary to the goals of copyright.

The U.S. Court of Appeals for the Federal Circuit: Java APIs are copyrightable but there is the possibility of a fair use defense.

The U.S. Supreme Court: Denied Google's petition for certiorari.

Was later granted certiorari. The amount of code copied was one small part of the considerably greater whole—less than 3% of the overall amount of code in the Java API, which totaled 2.86 million lines. And, the Android system is not a substitute for Java SE. [7], [8], [14]

3) Software Cloning:

Successful video games often find that identical games are being released based on pre- existing games. The general idea of a game can never be protected by copyright but the expression of the game can be protected based on the level of creativity used and novelty of the game. There are some cases that encompass this very issue.

Capcom U.S.A. Inc. v. Data East Corp.

Claim: The video game “Fighter’s History,” by Data East infringes upon its copyrights for the “Street Fighter II” series of video games made by Capcom.

Capcom released ”Street Fighter II” in 1991, after which Data East introduced ”Fighter’s History” in 1993 which Capcom claims copies the distinctive fighting styles, appearances, special moves and combination attacks of many of Street Fighter II’s characters, as well as the control sequences used to execute their moves.

Trail court: The general game play was not found to be so similar as to violate Capcom’s copyright. Large portions of ”Street Fighter II” were based on stereotypical characters and fighting techniques which were part of the public domain and hence not copyrightable. [9]

Tetris Holding, LLC v. Xio Interactive, Inc.

Claim: Plaintiffs Tetris Holding, LLC and the Tetris Company, LLC claimed that Defendant Xio Interactive, Inc. has infringed the copyright and trade-dress of Plaintiffs’ video game Tetris.

Xio acknowledged Tetris Holding’s copyright ownership and accepted that it intended to create a similar game, but argued that it did not copy any protected elements from Tetris. It asserted that its research showed the parts it copied were functional aspects of the game and argued that there was no protection for the rules and other functional elements of Tetris, and that it carefully crafted the game to avoid any protected elements. Here the visual expression, a non-functional trade dress, is copyrightable, the Fair use or Merger doctrine cannot address this issue - Xio has made a copyright infringement. Since The court focused on likelihood of confusion and found that consumers would easily be confused as to whether Xio was an authorized iteration of Tetris because of the similar packaging and advertising. [10], [11]

4) Software Reverse Engineering:

Another grey area in software is the ability to replicate a software by reverse engineering the functionality that it implements. There are multiple products in the market that have the exact same functionality. Even though the underlying code maybe different, these software have the exact same interfaces and functionalities.

SAS Institute Inc v World Programming Limited

Claim: World Programming had infringed copyrights on SAS Institute Products and Manuals, and whether World Programming used SAS Learning Edition to reverse engineer SAS system in violation with its term of usage.

SAS developed an analytical software where users can program using the SAS language to write and run application programs. A SAS license was required to utilize this application. WPL created World Programming System (WPS) that could also execute the application program that runs in SAS programming language. WPL did not have access to private SAS manuals or decompiled source codes.

High Court of England and Wales: No software copyright infringement of SAS components had occurred to create WPS. [12], [13]

IV. Results and Discussions

1) Discussions to court findings:

Lotus Development Corp. v. Borland International

- It is to be noted that software interfaces are not copyrightable unless they contain graphical elements such as icons.
- Software implementation is copyrightable i.e. the code written to implement the software implementation is subject to copyright.

Google LLC v. Oracle America, Inc.

- Software APIs are subject to copyright laws
- Even though APIs are entitled for copyright protection, fair use of API modules are permitted.

Capcom U.S.A. Inc. v. Data East Corp.

- The original game being cloned into a new game is a question of ethical standing.

- Software is granted copyright protection based on its uniqueness and novelty. The use of fighting techniques that are in the public domain, weaken their copyright claims.
- The criteria for software codes to obtain copyrights are stringent.

Tetris Holding, LLC v. Xio Interactive, Inc.

- Unlike the Capcom U.S.A. Inc. v. Data East Corp. case, Tetris made their game unique through colors, shape and movement incorporated in the game.
- This entitled Tetris to be qualified to receive copyright protection for the trade dress of the game which is non-functional.

SAS Institute Inc v World Programming Limited

- Reverse engineering is a legal grey area.
- Recreation of a service or software functionality that is exclusively provided by an entity does not lead to infringement provided that it is done without illegal access to private materials.
- This entitled Tetris to be qualified to receive copyright protection for the trade dress of the game.

2) Inferences:

Software is considered to be literary work under copyright as mentioned in 17 U.S. Code §102. Similar to other literary works, software infringement means that the newly created software is substantially similar to an already existing work that is protected by copyright. If the author has created his work independently, there is no infringement. This is applicable to software modules and the entire software as a whole as well. There are limited number of ways to implement a certain functionality in a particular programming language. It is extremely common for an author to independently develop code that is extensively similar to existing code. This holds true even more when a programmer has to take into consideration to write the most efficient code that makes use of minimum resources to achieve the fastest result. In such cases, there is no infringement of copyright.

Functional aspects of software is eligible for copyright protection. Certain mechanisms and implementations in a software if proven uniqueness is eligible to be given copyright protection unless they fall

under the public domain. In such scenarios, the author can protect his copyright by making his trade dress unique.

3) Further Discussion:

The biggest challenge in software copyright in my opinion is the fast onset of intelligence in today's machines. The new and blossoming fields in computer science pose new challenges in copyright. Technologies like augmented and virtual reality (AR,VR) , artificial intelligence and machine learning proactively make use of elements around us.

Technologies like AR and VR make use of virtual objects. In my opinion, the ability to create virtual objects that can be used in a virtual space adds another medium of expression. Artists can create 3D models which can be enjoyed by the public. Often times these models are created using toolkits specific to a platform. The question of who is the author of a work created by the use of a software toolkit is raised. Should the credit be given to the programmer who wrote the program to generate the work? Or should the person who generated the unique work be credited?

Similar to VR, AR can also give rise to new copyright issues. Real world objects can be modelled into a 3D digital version within AR. This can lead to copyright issues. Should a user of an AR application use a 3D digital version of a copyrighted work, would it be considered as infringement? [15]

Recently, a photographer whose camera was used by a monkey to take a selfie settled a two-year legal battle against an animal rights group about copyright over the image [17]. Who is to say that a similar situation will not arise with Artificial intelligence? AI software, computers will potentially create millions of original works that may then be protected by copyright, under current law. It is still a question in the legal world should these work should be awarded copyright protection. [16]

V. Conclusion

In conclusion, I believe that current copyright laws offer sufficient protection to traditional software implementations. Any independent work that are not expressive, even if it is recreated, done without access to illegal files is protected under copyright. The major concern to be noted is if the current laws offer protection to new works in more innovative mediums. I believe that there is not much protection offered for such works.

Since the scope of software is huge, I believe that it is not a farfetched proposal to have a new section for software. Originally, I feel that the section should include the following:

1) Independent works of software is protected under copyright.
2) Similar softwares of modules developed independently without illegal access to source code is protected under copyright.
3) Expressive elements in software like icons or graphics are subject to copyright provided that they are not in the public domain.
4) Reverse engineering of a software for the purpose of improving the stability and security of the software should be allowed provided that the results are shared only with the copyright owner and not used for any other purposes.
5) For expressive elements created with the use of tools for AR and VR, copyright is to be given to the person who created the element and not the programmer.
6) Real world objects converted into expressive elements for AR and VR are to be awarded copyright protection. The copyright is to be awarded to the programmer or entity that created the software.
7) The copyright protection of works created by computer intelligence should be awarded to the programer who developed the intelligence.

Copyright is made for the progress of Sciences and Useful Arts. With the onset of newer technologies and ease of replication of content and functionalities in today's digital era, the need to protect works of authorship significant now more than ever. Even though the copyright laws are drastically revised, they are still conservative and lack when it comes to the protection of newer digital content especially software. I believe that the separation of software copyright from today's conservative umbrella of copyright laws can spark innovation and liberality. I hope that this will benefit new content creators to come up with novel works or arts.

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