

1993

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John Houston

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Recommended Citation

John Houston, *A Unified Test for the Copyright Protection of the User Interface to Computer Programs*, 32 Duq. L. Rev. 133 (1993).

Available at: <https://dsc.duq.edu/dlr/vol32/iss1/5>

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A Unified Test for the Copyright Protection of the User Interface to Computer Programs

Copyright protection for the literal aspects¹ of computer software has been accepted for many years.² However, due to new and emerging computer technologies, along with the rise in popularity of the personal computer ("PC"), a new set of copyright issues has emerged. A dominant theme in a number of recent cases has shifted from claims of infringement through the copying of program structures³ or computer source code⁴ to the copying of non-literal aspects of the program.⁵ The court's opinion in the 1992 decision of *Computer Associates International, Inc. v. Altai, Inc.* provides a good summary of the confusion and concerns with re-

1. Copyright protection, as defined in the Copyright Act of 1976, "subsists, in original works of authorship fixed in any tangible medium of expression . . . from which they can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device." 17 U.S.C. § 102 (1991). While works of authorship include such things as literary works, musical works, motion pictures and sound recordings, they do not include ideas, processes, procedures, systems, etc. *Id.* Therefore, a copyright can be thought of as protecting the expression of an idea and not protecting the underlying idea itself. The literal aspects of a computer program include such aspects as the source code of the program. *Lotus Development Corp. v. Paperback Software Int'l*, 740 F. Supp. 37, 44 (D. Mass. 1990).

2. *Computer Assoc. Int'l, Inc. v. Altai, Inc.*, 982 F.2d 693, 702 (2d Cir. 1992).

3. When a computer program is first conceptualized, the programmer will often create a flowchart that defines the logical flow that the computer program will follow. From this flowchart the programmer will start to define discrete modules that will be used to create the program. These discrete modules, when tied together, create the program structure. Program efficiency often depends upon this program structure. *Whelan Assoc., Inc. v. Jaslow Dental Laboratory, Inc.*, 797 F.2d 1222, 1229-30 (3d Cir. 1986), *cert. denied*, 479 U.S. 1031 (1987).

4. Congress has defined a computer program as "a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result." 17 U.S.C. § 101 (1988). Computer source code is defined as a computer program written in some high level computer language such as COBOL, FORTRAN or "C." *Lotus v. Paperback*, 740 F. Supp. at 44. A high level computer language is a set of statements or instructions that permits a programmer to describe in English-like syntax the steps that are required to bring about a certain result. By using a source code compiler, the English-like syntax is converted into a set of instructions that the computer can understand. These instructions are collectively called "object code." *Whelan*, 797 F.2d at 1230-31.

5. The non-literal aspects of the computer program include the user interface and the program's general "look and feel." The user interface is made up of the computer monitor's visual display along with the user's ability to enter commands from an attached keyboard or alternative input device. *Apple Computer, Inc. v. Microsoft Corp.*, 799 F. Supp. 1006, 1017 (N.D. Cal. 1992).

spect to copyrightability of the non-literal aspect of computer programs in general.⁶ The court stated:

To be frank, the exact contours of copyright protection for non-literal program structure are not completely clear. We trust that as future cases are decided, those limits will become better defined. Indeed, it may well be that the Copyright Act⁷ serves as a relatively weak barrier against public access to the theoretical interstices behind a program's source and object codes.⁸ This results from the hybrid nature of a computer program, which, while it is literary expression, is also a highly functional, utilitarian component in the larger process of computing.

Generally, we think that copyright registration—with its indiscriminating availability—is not ideally suited to deal with the highly dynamic technology of computer science.⁹

Two cases decided in 1992 demonstrate the attitude of the courts and seem to mark the direction of future cases involving the copying of computer program user interfaces. In the first case, *Lotus Development Corp. v. Borland International, Inc.*,¹⁰ the defendant copied the user interface to the plaintiff's program, Lotus 1-2-3.¹¹ While the case differed from earlier cases involving the copying of the user interface to Lotus 1-2-3, in that the user interface in only one segment of Borland's program was similar to the Lotus 1-2-3 user interface, the similarity was sufficient for Lotus' copyright to be infringed. In this case, the court found the Lotus 1-2-3 interface to be "expressive" and not functional and therefore, copyrightable.¹²

The second case marking the direction of future copyright cases was *Apple Computer, Inc. v. Microsoft Corp.*¹³ In *Apple*, the court limited the scope of copyright protection for user interfaces where the elements of the user interface can only be expressed in a limited number of ways or where the expression of the idea has "merged" with the idea itself.¹⁴

6. *Computer Associates*, 982 F.2d at 702.

7. 17 U.S.C. §§ 101-810 (1988).

8. See note 4 and accompanying text.

9. *Computer Associates*, 982 F.2d at 712.

10. 799 F. Supp. 203 (D. Mass. 1992). See notes 58-62.

11. *Lotus v. Borland*, 799 F. Supp. at 205. Lotus 1-2-3 is a "spreadsheet" computer program that was originally designed for the DOS PC. A spreadsheet program allows the user to organize data of different types into rows and columns. Once the data has been organized, the program can then be used to perform calculations on the rows and columns. An example of how a spreadsheet program might be used is to create a simple ledger for a business.

12. *Id.* at 219.

13. 799 F. Supp. 1006 (N.D. Cal. 1992).

14. *Apple*, 799 F. Supp. at 1041-42.

In deciding these cases, the courts appear to have contradicted a number of older decisions.¹⁵ In addition, the recent decisions may appear even to be contradictory among themselves. However, together, both the older and recent decisions can be used to synthesize and chart a clear, concise, rational and unified test for deciding future non-literal computer software copyright infringement cases.

BACKGROUND

In 1981, International Business Machines, Inc. ("IBM") introduced the first IBM PC computer ("DOS PC"). In 1984, Apple Computer, Inc. introduced its first version of the Apple Macintosh computer ("MAC"). The MAC and DOS PC were each unique in their designs. The MAC is a "graphical user interface" ("GUI") based system¹⁶ with bitmap graphics.¹⁷ The characteristic windows, menus and icons make up what Apple terms as its "desktop metaphor." The philosophy of the "desktop metaphor" is to present the user with many of the items and actions that a user would find or do at the user's desk. While the "desktop metaphor" was viewed by Apple as new and unique, the vast majority of its ideas originated in earlier "GUI" based systems.¹⁸

The DOS PC was originally and is in many cases today best described as a "character based interface" system.¹⁹ The "character

15. See *Digital Communications Assocs., Inc. v. Softklone Distributing Corp.*, 659 F. Supp. 449 (N.D. Ga. 1987). The *Digital Communications* court stated:

Therefore, it is this court's opinion that a computer program's copyright protection does not extend to the program's screen displays and that copying of a program's screen displays, without evidence of copying of the program's source code, object code, sequence, organization or structure, does not state a claim of infringement.

Digital Communications, 659 F. Supp. at 456.

16. The best description of a "GUI" based system was provided by the *Apple* court when describing the Apple Macintosh's "GUI":

[S]creen displays include icons or symbols to represent programs or information, pull down menus or lists of commands or information, use of windows to display information and the ability to move, re-size, open or close those windows to retrieve, put away or modify information, and a display of text by a proportionally spaced font in all menu items, title bars, icon names and text directories for a consistent and distinctive appearance.

Apple, 799 F. Supp. at 1017.

17. Bitmap graphics are composed of dots on the computer monitor. These dots are commonly referred to as pixels and can be colored or shaded to create complex patterns. *Id.* at 1018.

18. *Id.* at 1017. Such early "GUI" based systems included systems developed by Xerox, Perq and Apollo Computer Corp. *Id.* at 1024.

19. The best description of a "character based interface" system was provided by the court in *Apple*:

based interface" is a common characteristic of most "multi-user computers"²⁰ used in the industry today. Not until the recent rise in popularity of Microsoft Windows version 3.0²¹ and the availability of more advanced graphics, could the DOS PC be characterized to embody the most distinctive features that the MAC provides.

While the appearance and functionality of the MAC and DOS PC differ greatly, they have four common features. First, the two are priced so that the consumer can reasonably purchase either one.²² Second, the computers have sufficient processing power to provide for practical use.²³ Third, each computer has the same basic design.²⁴ Lastly, each computer has a powerful graphic subsystem.²⁵

Programs written for computers having only limited amounts of such memory are forced to base their visual displays on vertically or horizontally defined lines . . . [s]uch a visual interface is generally termed an alphanumeric or character based interface and lacks the ability to generate the more complex shapes, forms, artistry and animation associated with a graphical user interface. See note 16. A user wanting to start a word processing application, for example, in an alphanumeric or character-based interface might type the command "Exec WS" or to create a new file might type "Dup. F. Txt".

Apple, 799 F. Supp. at 1018.

20. A "multi-user" computer is a computer which more than one user shares the computer's central processing unit ("CPU") simultaneously. The CPU "contains the electronic circuits that control the computer and perform the arithmetic and logical functions". *Lotus v. Paperback*, 740 F. Supp. at 43. On most "multi-user" computers, the users interact with the computer by a computer terminal, which is comprised of a computer display and a keyboard. A computer terminal is in turn attached to the computer by an electrical cable that is used to transmit data between the computer and the terminal.

21. Microsoft Windows version 3.0 is a computer program that is run on a DOS PC and "extends its visual and graphical capabilities" of the computer beyond that of a "character based interface" system. *Apple*, 799 F. Supp. at 1019.

22. A typical DOS PC or MAC can be purchased for less than two thousand dollars.

23. As an example, a reasonably configured DOS PC or MAC sold today is capable of easily manipulating (adding, deleting, moving and copying) text and graphics within a document of hundreds of pages using a word processing package.

24. The court in *Lotus v. Paperback* provided a good overview of the design of a DOS PC and a MAC:

A personal computer consists of hardware and software. The hardware includes the central processing unit ("CPU"), which contains the electronic circuits that control the computer and perform the arithmetic and logical functions, the internal memory of the computer ("random access memory," or "RAM"), input devices such as a keyboard and mouse, output devices such as a display screen and printer, and storage devices such as hard and floppy disk drives.

Lotus v. Paperback, 740 F. Supp. at 43.

25. Graphics on the DOS PC and the MAC are performed using a separate CPU and RAM than that of the computer itself. Therefore the computer's main CPU is not burdened with performing the calculations required to display information and graphics on the computer display screen. The graphic CPU is dedicated to performing graphics-related calculations and is optimized to perform these calculations very efficiently. This also leads to faster

Along with the above mentioned features, software developed for these computers is unique (as compared to software developed for multi-user computer systems), due to both the targeted user of the computer²⁶ and the power of the computer processor and the graphics.²⁷ One of the important differentiating features found in software developed for DOS PCs and MACs is the emphasis on ease of use. Ease of use is most often accomplished through the development of good user interfaces.²⁸

What makes a user interface "good" depends upon a number of factors and can be accomplished in many ways. At its most basic level, a good user interface is one that permits a user to perform the desired functions found in the computer software package with a minimum of effort. The mark of a good user interface is that the functionality²⁹ and operation of the computer software package is intuitive. When a program is developed that has a good user interface, fills a need of users and is successful, the user interface is as valuable and likely accounts as much for the success of the product as the underlying structure of the software. Many computer software packages today may match functionality with their competition, but a package's success or reputation is due to its user interface.³⁰ Therefore, copyright protection that is limited to protecting the structure or literal elements of the software, protects little if the user interface is left open to unchecked copying.

display of graphics.

26. As indicated by the name, the DOS PC was designed for "personal" use. Clearly, whether used in the business environment or in the home, the computer was designed for use by persons who did not have formal computer training.

27. Even though multi-user computer systems are generally more powerful than DOS PCs, since the CPU is shared among multiple simultaneous users, each user has less processor resources than the DOS PC user.

28. A user interface is the combination of the "computer monitor's visual displays and the user command functions on the keyboard or other input devices." *Apple*, 799 F. Supp. at 1017.

29. The functionality of a computer software program refers to the capabilities. For example, basic functionality within a word processing package would include adding, deleting, moving or copying text or graphics within a document.

30. This is evidenced by the fact that computer software developers have sued to prevent competitors from copying their user interfaces. See *Lotus v. Borland*, 799 F. Supp. at 203 (holding that the owner of a software program infringed the competitor's user interface program by taking expressive, nonfunctional elements of menu commands, menu command structure, macro language, and key stroke consequences). See also *Lotus v. Paperback*, 740 F. Supp. at 37 (holding that the menu command structure of computer spreadsheet program, including the choice of command terms, structure and order of those terms, their presentation on the screen and the long prompts, was copyrightable).

ANALYSIS

Case History

In the 1978 decision of *Synercom Technology v. University Computer Co.*,³¹ the court determined that federal copyright protection covers only the literal aspects of the program and not non-literal aspects, such as the user interface.³² The *Synercom* decision represents the early view of the courts and is prevalent in other cases that appeared through the 1980s.

The 1986 decision of *Whelan Associates v. Jaslow Dental Laboratory, Inc.*,³³ departed from *Synercom* by stating that non-literal aspects of a computer program are covered by copyright protection, but stopped short of providing coverage for the user interface of a computer program.³⁴ *Whelan* separated copyright coverage for audiovisual works (and by inference for user interfaces) and required a second copyright.³⁵

Applying the *Whelan* decision, the court in *Broderbund Software, Inc. v. Unison World*³⁶ determined that copyright protection not only covers the literal elements of the computer program, but also non-literal elements including audiovisual displays.³⁷ In this case, the defendant created a graphics art package that was directly derived from the plaintiff's program.³⁸ The defendant had started to develop the program using the plaintiff's program as a model.³⁹ Only in the later stages of program development, when negotiations to license the user interface failed, did the defendant stop using the plaintiff's program as a model.⁴⁰ In the end, many aspects of the defendant's user interface looked identi-

31. 462 F. Supp. 1003 (N.D. Tex. 1978).

32. *Synercom*, 462 F. Supp. at 1014.

33. 797 F.2d 1222.

34. *Id.* at 1234. The case involved the creation of a computer program by the defendant's copying of the structure and overall organization of the plaintiff's program. The defendant had a copy of the source code for the plaintiff's program. *Id.* at 1232.

35. *Id.* at 1244. The court stated that "screen outputs are completely irrelevant to the question whether the copyright in the program has been infringed. Rather the only conclusion to be drawn from the fact of the different copyrights is that the screen output cannot be direct evidence of copyright infringement." *Id.*

36. 648 F. Supp. 1127 (N.D. Cal. 1986).

37. *Broderbund*, 648 F. Supp. at 1133. The defendant created a computer program by copying the user interface of the plaintiff's program. *Id.* at 1130-31. The defendant had a copy of the plaintiff's program on which to model his program. *Id.*

38. *Id.*

39. *Id.* at 1131.

40. *Id.*

cal to the plaintiff's user interface.⁴¹ The court determined that the defendant's program was substantially similar and thus infringed upon the plaintiff's copyright.⁴²

In the 1987 of decision *Digital Communications Associates v. Softklone Distributing Corp.*,⁴³ the plaintiff created a computer program that was used to transfer data between computers.⁴⁴ The program embodied a distinctive and well received "status screen" that displayed various "program settings or parameters" that the user could modify.⁴⁵ While the court in *Digital Communications* agreed that the copyright protection granted to a computer program encompassed more than the literal aspect of the program, the court decided that the screen displays created by the program were not protected.⁴⁶ The only situation in which a program's screen display would be protected would be if there existed evidence of copying of the programs source code, object code, sequence, organization or structure.⁴⁷ The *Digital Communications* decision is significant because the court specifically cited and criticized the *Broderbund* case. The court stated that the conclusion in *Broderbund*, that a copyright of the program extended to cover the user interface aspect of the computer program, was incorrect and an overly broad construction of *Whelan*.⁴⁸

The plaintiff in *Digital Communications* had obtained a separate copyright for the status screens in its program, in addition to the copyright it obtained for the literal aspects of the software.⁴⁹ The court, in a decision that is compatible with *Whelan*, ultimately determined that the second copyright of the status screen was valid and enforceable.⁵⁰ The court found that copying of the

41. *Id.*

42. *Broderbund*, 648 F. Supp. at 1138.

43. 659 F. Supp. 449.

44. *Digital Communications*, 659 F. Supp. at 452.

45. *Id.* A program setting or parameter is a variable within the software that can be set to a specific value. For example, within a word processing application an example of a program settings that the user can modify is a line spacing setting. On a typical word processing application, if the user wanted to double space a document, the user would modify the setting to the value specified by the software developer that represents double spacing.

46. *Id.* at 455. The court stated that "copyright protection of a computer program extends beyond a program's literal source or object code to its structure, sequence and organization." *Id.*

47. *Id.* at 456. Specifically, the court stated that the conclusion in *Broderbund* was "an over-expansive and erroneous reading of *Whelan*." *Id.*

48. *Id.* at 455. See also *Broderbund*, 648 F. Supp. at 1133.

49. *Digital Communications*, 659 F. Supp. at 456.

50. *Id.* at 456. The court rejected the defendant's arguments that the status screen

status screen was demonstrated by substantial similarity and that the defendant's status screen had captured the "total concept and feel" of the plaintiff's status screen.⁵¹

In 1990, *Lotus Development Corp. v. Paperback Software International*⁵² was decided. Paperback Software marketed a software package that, by design, had a user interface that was similar to the interface of Lotus 1-2-3.⁵³ The court determined that the Lotus 1-2-3 user interface was a copyrightable expression.⁵⁴ The court stated that it is important not to draw the lines between copyrightable and non-copyrightable expressions too narrowly so as to "ignore the accommodation struck by Congress in choosing to advance the public welfare by rewarding authors,"⁵⁵ or to draw the lines too broad so as to "bestow strong monopolies over specific applications."⁵⁶ The court refuted the determinations of the *Whelan* and *Digital* courts that a separate copyright is required for screen displays.⁵⁷

was a necessary expression of the idea and that status screens amount to an uncopyrightable blank form, stating:

If there are "various means [to] achiev[e] the 'desired purpose', then the particular means chosen is not necessary to the purpose. . . ." *Id.* at 458 (citations omitted). If there is only one means, then the means merges with the idea and that precludes copyright protection. *Id.* at 457 (citations omitted).

As a general proposition, a blank form is not copyrightable. *Baker v. Selden*, 101 U.S. 99 (1879). The court determined that "if the work provides the user information beyond simply indicating where to record data then the work is copyrightable." *Digital Communications*, 659 F. Supp. at 462. Even when a screen is copyrighted, the copyright is still only limited to the arrangement and design of the screen and does not control over the ideas of the program, status screen or the particular "command terms or symbols" used within the software. *Id.*

51. *Id.* at 465.

52. 740 F. Supp. 37 (D. Mass. 1990).

53. *Lotus v. Paperback*, 740 F. Supp. at 68-69. In actuality, the defendant had copied the user interface of Lotus 1-2-3, feeling that the success of its product required that it have a similar user interface to that of Lotus 1-2-3. *Id.* at 69.

54. *Id.* at 68. The court stated:

I conclude that the user interface and some other non-literal aspects of computer programs are not merely articles "having an intrinsic utilitarian function." When computer programs include elements — both literal and non-literal — "that can be identified separately from and are capable of existing independently of the utilitarian aspects of the article," they are potentially copyrightable.

Id. at 54 (citations omitted).

55. *Id.* at 53.

56. *Id.*

57. *Id.* at 79-80. The court decided that the copyright of the entire work is sufficient to protect the "screen displays." The court then explained that the copyright office instructs authors to register on a single application form for a single work using the application form "in the class most appropriate to the type of authorship that predominated in the work being registered." *Id.* at 81.

In *Lotus Development Corporation v. Borland International, Inc.*,⁵⁸ the defendant was found to have copied the user interface of the plaintiff's program.⁵⁹ This case differed from the earlier Lotus case in that Borland's product had numerous user interfaces from which the user could choose.⁶⁰ If the user was accustomed to using the Lotus 1-2-3 interface, the user could use the defendant's program in a mode that presented a user interface similar to the one found in Lotus 1-2-3.⁶¹ Therefore, only one aspect of the defendant's user interface was copied. In this case, the court made only a cursory exploration into the possibility that the user interface was not copyrightable, rejecting the defendant's contention that user interface was not copyrightable because it was not fixed in a tangible medium.⁶²

The most recent case to address user interface issues is *Apple Computer, Inc. v. Microsoft Corporation*.⁶³ In *Apple*, the district court failed to discuss the possibility that the user interface was separate or not copyrightable. The court also appeared to accept the proposition that the copyright of the computer program encompassed the user interface and screen displays. Additionally, the court limited the scope of copyright protection for user interfaces where the elements of the user interface can only be expressed in a limited number of ways or where the expression of the idea had "merged" with the idea itself.⁶⁴

From the cases cited above, it is clear that the attitude of the courts has changed dramatically. Early cases demonstrated the attitude that copyright protection was very narrow and covered only literal infringement of the copyrighted work. Recent decisions have been directly opposed to the earlier cases and demonstrate the courts' realization that when copyright statutes are read narrowly,

58. 799 F. Supp. 203.

59. *Lotus v. Borland*, 799 F. Supp. at 223.

60. *Id.* at 205-06.

61. *Id.* at 205. The court determined that Borland had not copied the entire Lotus 1-2-3 interface, it had copied parts of the interface. *Id.*

62. *Id.* at 208-09. The court stated:

All that is required in this regard is that the expression be embodied in a copy "by or under the authority of the author" in a form "sufficiently stable to permit it to be perceived, reproduced, or otherwise communicated for a period of more than a transitory duration." . . . The output of a computer program, at least insofar as it is typical of the program, predictable from it, and directed by the operation of the program, satisfies these requirements.

Id. (citation omitted).

63. 799 F. Supp. 1006 (N.D. Cal. 1992).

64. *Apple*, 799 F. Supp. at 1041-42.

valuable non-literal elements of the software (such as the user interface) are left open to copying. It appears that the courts realize that these non-literal elements are as valuable, if not more valuable, than the program code and structure itself and, therefore, warrant protection.

BARS TO COPYRIGHT PROTECTION

Prior to discussing the various tests used by the courts to determine copyright infringement, a number of bars to copyright should be discussed. Each bar acts to prevent the copyright of an idea, that would otherwise be copyrightable. The concepts of "merger," "scenes a faire," "functionality," and "lack of originality" are all bars. While a number of other courts have discussed these concepts, the *Apple* court provided the best insight into each.

"Merger," simply stated, "means that there is practically only one way to express an idea."⁶⁵ Merger does not preclude copyright protection where there is "more than one avenue of expression available," but when "technical or conceptual constraints limit the available ways to express an idea," then copyright protection will not be available.⁶⁶ For example, the MAC can run multiple applications at one time. Each application displays its information to the user in a separate window.⁶⁷ Each of the windows displayed could partially or completely overlap the other windows. The *Apple* court determined that Apple could not copyright such window actions because there were conceivably two ways to display multiple programs on the screen.⁶⁸

Scenes a faire "originated in stock characters and features of dramatic works, . . . and now encompasses stereotyped expression, standards or common features in a wide variety of works, including audiovisual works generated by computers."⁶⁹ Building on the example used to describe the concept of "merger," the court in *Apple* determined that "scenes a faire" prevented copyright protection for the action of bringing a window to the forefront when it is se-

65. *Id.* at 1021.

66. *Id.*

67. A window is defined as "an area of the screen with visible boundaries through which information is displayed". The windows can be of any size up to the physical size of the computer video screen, with one window either partially or completely overlapping another. JON PEDDIE, *GRAPHICAL USER INTERFACES AND GRAPHICAL STANDARDS* 258 (1992).

68. *Apple*, 799 F. Supp. at 1027-31.

69. *Id.* at 1021.

lected by the user.⁷⁰ The basis of the court's decision was that bringing the "active window" to the forefront is a very general and abstract concept and serves a utilitarian purpose of preventing accidental input.⁷¹

Copyright protection covers expressions of ideas, not the underlying ideas themselves.⁷² If an expression of an idea is itself functional, then the expression may not be protected by copyright.⁷³ If the expression of an idea is tightly tied to the idea itself so that to copyright the expression would have the effect to foreclose the use of the idea by others, then the expression cannot be copyrighted. Only where "artistic features" can be identified, separated from and exist separately as "a work of art" can the "artistic features" (expressions) be copyrighted.⁷⁴

Lack of originality is also a bar to copyrightability.⁷⁵ Where a work embodies previous expressions, the work's copyright does not extend to cover the expressions. If an expression of an idea was created in the past and was not copyrighted, then the original author has chosen to place the expression in the public domain. Once in the public domain, the expression is available for free use by others. In *Apple*, the main attributes that Apple was trying to protect were found in computer systems that were developed much earlier.⁷⁶ In such cases, it would be contrary to the Copyright Act to permit copyright protection if the work was not original.

RULES GOVERNING COPYRIGHTABILITY AND INFRINGEMENT

Courts have differed greatly regarding the appropriate tests to

70. *Id.* at 1033.

71. *Id.* at 1032-33. An active window is the window with which the user is currently interacting. This is the window that receives the characters. *PEDDIE*, cited at note 67, at 246.

72. PAUL GOLDSTEIN, *COPYRIGHT, PATENT, TRADEMARK AND RELATED STATE DOCTRINES CASES AND MATERIALS ON THE LAW OF INTELLECTUAL PROPERTY* 567 (1993). Copyright never precludes a person from using an idea. Copyright rather protects an author's expression of that idea. While computer programs are generally expressions of ideas, the ideas, processes or methods that the programmer is trying to capture in the program are not copyrightable. *Id.*

73. *Apple*, 799 F. Supp. 1021. Section 102(b) of the Copyright Act of 1976 states that "[i]n no case does copyright protection for an original work of authorship extend to any idea, procedure, process, system, method of operation, concept, principle or discovery, regardless of the form in which it is described, explained, illustrated or embodied in such work." 17 U.S.C. § 102(b) (1988).

74. *See Apple*, 799 F. Supp. at 1023.

75. 17 U.S.C. § 102(a) (1988). Section 102(a) of the Copyright Act of 1976 states, "[c]opyright protection subsists, in accordance with this title, in original works of authorship" *Id.*

76. *Apple*, 799 F. Supp. at 1024.

apply to copyright cases involving copyrightability and infringement of non-literal elements of a computer program. At this time, there is no clear indication as to the adoption of a single test in either case.

In *Digital Communications*, the court determined that a two-step test should be used to determine substantial similarity (and thus copyright infringement).⁷⁷ The test first requires that the court apply an "extrinsic" test.⁷⁸ The extrinsic test is designed to determine whether the underlying ideas are substantially similar.⁷⁹ The court must next apply the "intrinsic" test to determine whether there is substantial similarity of the expressions.⁸⁰ While the test is straightforward and simple, one serious problem is apparent. The *Whelan* court determined that the intrinsic portion of the test was ill suited for determining infringement in computer software cases because of the complexity of computer programs.⁸¹ More specifically, the problem occurs when applying the extrinsic/intrinsic test to situations where copyrightable and non-copyrightable expressions are intertwined. The test does not accommodate the isolation and removal of the unprotected expression from the work being tested.

The court in *Digital Communications* also interjected the idea of a "concept and feel" test.⁸² This test is simply the intrinsic portion of the extrinsic/intrinsic test and has been criticized.⁸³

The court developed a three-part test to determine copyright-

77. *Digital Communications*, 659 F. Supp. at 464-65.

78. *Id.* at 465.

79. *Id.* The court in *Broderbund* stated that to prove similarity under the extrinsic test, "[a]nalytic dissection and expert testimony" are required. *Broderbund*, 648 F. Supp. at 1136.

80. *Digital Communication*, 659 F. Supp at 465. The court in *Broderbund* states that the intrinsic test "consists solely of the response of the 'ordinary reasonable person.'" *Broderbund*, 648 F. Supp. at 1137.

81. *Whelan*, 797 F.2d at 1233. The court stated:

[W]e believe that the ordinary observer test is not useful and is potentially misleading when the subjects of the copyright are particularly complex, such as computer programs. We therefore join the growing number of courts which do not apply the ordinary observer test in copyright cases involving exceptionally difficult material, like computer programs, but instead adopt a single substantial similarity inquiry according to which both lay and expert testimony would be admissible.

Id.

82. *Digital Communications*, 659 F. Supp. at 465.

83. *See Apple*, 799 F. Supp. at 1020 n.11. "The court does not believe that the *Data East* panel's reference to 'total concept and feel' is an endorsement of Apple's expansive 'look and feel' theory. Indeed, both 'look and feel' and 'total concept and feel' have been soundly criticized." *Id.*

ability⁸⁴ in *Lotus v. Paperback Software*⁸⁵ and *Lotus v. Borland*.⁸⁶ The first step is to distinguish between an idea and the expression of this idea. The second step is to determine whether the expression includes non-essential elements. Finally, the analysis must determine whether the non-essential elements are part of a copy-rightable work.

Applying this test, the fact finder in essence would extract those expressions that are "functional" and thus not copyrightable. In theory, once extracted, all that is left is expression that is potentially copyrightable. The problem with this test is that it fails to remove those expressions that are uncopyrightable due to "merger", "scenes a faire", and "lack of originality."

In *Computer Associates*, the court formulated another three-step procedure that combines both the tests for copyrightability and substantial similarity in situations involving non-literal copying.⁸⁷ The first step in the process is called the "abstraction" step, in which the court dissects the program down into its "constituent structural parts."⁸⁸ The second step is called "filtration" and entails the examination of the "structural components at each level

84. *Lotus v. Paperback*, 740 F. Supp. at 60. See *Lotus v. Borland*, 799 F. Supp. at 211, where the court enunciated the test as follows:

FIRST, in making the determination of "copyrightability," the decisionmaker must focus upon alternatives that counsel may suggest, or the court may conceive, along the scale from the most generalized conception to the most particularized, and choose some formulation, some conception of the "idea," "system," "process," "procedure," or "method" — for the purpose of distinguishing between the idea, system, process, procedure, or method and its expression.

SECOND, the decisionmaker must focus upon whether an alleged expression of the idea, system, process, procedure, or method is limited to elements essential to expression of that idea, system, process, procedure, or method . . . or instead includes identifiable elements of expression not essential to every expression of that idea, system, process, procedure, or method.

THIRD, having identified elements of the expression not essential to every expression of the idea, system, process, procedure, or method, the decisionmaker must focus on whether those expressive elements, taken together, are a substantial part of the allegedly copyrightable work.

Lotus v. Borland, 799 F. Supp. at 211.

85. 740 F. Supp. 37.

86. 799 F. Supp. 203.

87. *Computer Associates*, 982 F.2d at 706-12.

88. *Id.* at 706-07. The court stated that "any given work may consist of a mixture of numerous ideas and expressions". *Id.* at 707 (citations omitted). The process involves the isolation of each level of abstraction of the program. *Id.* With the least amount of abstraction, the program "may be thought of in its entirety as a set of individual instructions." *Id.* At the highest level of abstraction, "one is left with nothing but the ultimate function of the program." *Id.* The goal of abstraction is to "map each of the designer's steps in the opposite order in which they were taken during the program's creation." *Id.*

of abstraction.”⁸⁹ At each level, the structural parts that become included are examined to determine if they are ideas, expression or are unprotected expression (due to the bars listed above).⁹⁰ The third step requires “comparison” of the different non-literal protectable expressions that are selected during the “filtration” step.⁹¹ The “comparison” focuses on whether those protectable expressions selected in the “filtration” process are substantially similar in the original and new work.⁹² While this test appears unique from the other test outlined, the *Lotus v. Borland* court determined that this test is functionally equivalent to the test forwarded in that case.⁹³ It seems clear that even from the short description provided, the Abstraction-Filtration-Comparison test is a very difficult test to comprehend and apply. To use the test, a court would require a significant understanding of software development methodologies and techniques. For this reason, it seems apparent that this test could likely be misunderstood and misapplied. Therefore, this test would not be appropriate to adopt as a standard test for determining copyrightability or substantial similarity.

CONCLUSION/PROPOSAL

It is apparent that the tests proffered to date either fail to adequately address the bars to copyright protection or are difficult to synthesize. The goal of this analysis is to provide a test that is easy to apply yet is equitable, encompasses all required issues and is in keeping with the decisions in prior cases. The test proposed consists of four parts and reverses the order with which past copyright analysis of user interfaces or non-literal aspects of computer programs were performed.

89. *Id.* at 707. This step's purpose is to define the “scope of plaintiff's copyright.” *Id.*

90. *Id.*

91. *Id.* at 710-11.

92. *Id.* at 710.

93. *Lotus v. Borland*, 799 F. Supp. at 211-12. The court stated:

I conclude that the standard for determining copyrightability . . . is compatible with the abstraction-filtration portion of the Second Circuit's test. The Second Circuit founded its abstraction step on the opinions of Judge Learned Hand that were also the foundation of the first set of the copyrightability test . . . The second step of that copyrightability test parallels the Second Circuit's “filtration” step.

The third step of the Second Circuit test, “comparison”, serves two functions. The first concerns the issue addressed in the third step of the “copyrightability” test I have tentatively adopted for this case — whether the expressive elements of the allegedly copyrightable work are a substantial part of it. I conclude that in this respect the two tests are compatible substantively though different in methodology.

The first step in the analysis is to perform a "look and feel" analysis to determine if the works are in fact similar. The two works would be viewed side by side to determine if they look similar. The comparison would require the fact finder to look not only at the screen displays, but also at a variety of other non-literal aspects of the program. This step would include a review of the flows of the programs to determine if the primary "functionalities" and purposes of the programs are the same and are achieved in the same way. Additionally, such aspects as menu or command syntax and screen layout should be considered.

If the programs are deemed similar, then the fact finder would next list those discrete non-literal components of the work that caused the fact finder to consider the works to be similar. As in the first step, the fact finder should not only list similarities in appearance, but should also list such aspects as program flow. To compile the list, the fact finder need only describe the appearance or action that is found to be similar. No discussion as to programming technique or program structure is required or expected.

The third step would be to determine if any or all of the listed elements are barred from copyright protection due to one of the previously mentioned bars. An element in the list that is found not to be copyrightable would be removed from the list. This step requires the fact finder to employ expert assistance to determine whether a listed element falls within the realm of one of the bars.

The resulting list then would be used in the fourth step, which then would view the works again. This review would require a side-by-side comparison of the works both as a whole and of those elements contained in the list created in the third step. The court could then determine if those elements still remaining in the defendant's work, when compared to the plaintiff's work as a whole, would cause the works to be considered substantially similar. In addition, the court could decide if those elements in the list (created in the third step) are copyrightable expressions and thus infringed.

The advantage of this test is fourfold. First, the test is clear and easy to understand. A number of the tests cited are difficult to understand, let alone apply.⁹⁴ For any test to be adopted as the standard, it must be of a form that is easily comprehended not only by the courts but by those who require notice. Further, if a test is unclear or difficult to understand, then the possibility of error in-

94. See notes 87-96 and accompanying text.

creases. Second, the test is concise and can be accomplished with less effort than other tests cited. A number of the recent tests forwarded appear to be quite tedious and time consuming.⁹⁵ The practical effect of applying any test that requires excessive effort or time to apply is to increase the likelihood of error. Third, the test is complete. A number of tests cited fail to consider relevant factors, such as accepted bars to copyright protection, when determining whether a work is copyrightable and whether the copyright has been infringed.⁹⁶ To fail to address all relevant factors could lead to improperly assigning original authorship to works. Fourth, the test is compatible with trends evidenced in recent cases. Reviewing the court decisions in a number of recent cases cited, if this test had been applied to those cases, not only could the courts have arrived at the same result, but the test would be in keeping with the direction of the various courts' thinking.

John Houston

95. See notes 87-96 and accompanying text.

96. See notes 38-42, 87-89 and accompanying text.