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Copyright Protection for Computer Software after Whelan Associates v. Jaslow Dental Laboratory

Wm. David Taylor III

COMMENTS

COPYRIGHT PROTECTION FOR COMPUTER SOFTWARE AFTER *WHELAN ASSOCIATES v. JASLOW DENTAL LABORATORY*[1]

I. INTRODUCTION

Computer technology is among the most rapidly changing aspects of society, something which few would say of the law. Indeed, the meeting of the two might be said to resemble a confrontation between the proverbial tortoise and hare. Nevertheless, the courts have begun to confront the issues which this most modern form of intellectual property raises.

Whelan Associates v. Jaslow Dental Laboratory is arguably the most significant of the growing number of recent decisions which have addressed the scope of copyright protection available to computer software.[2] Resolving the case of first impression in the federal appellate courts, the Third Circuit held that copyright law protects the structure and organization of a computer program, not just the literal computer code in which the program is written. The court also declared a rule for distinguishing protected and unprotected aspects of computer programs,[3] and announced a modified substantial similarity test for use in computer software cases.

The *Whelan* ruling was reported as "a 'bombshell' for the computer industry,"[4] and a "landmark decision" which represents "the farthest extension" of copyright protection of software by the courts to date.[5] It

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1. 797 F.2d 1222 (3d Cir. 1986), *cert. denied sub. nom.* Jaslow Dental Laboratory, Inc. v. Whelan Assocs., 479 U.S. 1031 (1987).
2. *Id.* The intense interest this issue arouses in the computer industry and the general business community is easily explained: software sales in the United States now total in the tens of billions of dollars annually. STANDARD & POORS, *Computers & Office Equipment*, in STANDARD & POORS IND. SURVEYS (1987).
3. The rule distinguishes idea from expression in the computer software context. The idea-expression dichotomy, one of the fundamental concepts underlying copyright law, reflects the fact that copyright does not protect ideas, but does protect their expression. Copyright Act of 1976, 17 U.S.C. § 102 (1982); Baker v. Selden, 101 U.S. 99 (1879); *see infra* notes 53, 89-102 and accompanying text.
4. Staines, *Idée or idée fixe?*, 50 MOD. L. REV. 368, 369-70 (1987).
5. Maier, *Software Protection—Integrating Patent, Copyright and Trade*

has already generated controversy among scholars,[6] influenced subsequent federal trial court decisions,[7] and raised the possibility of a split in authority among the federal circuit courts.[8]

II. FACTS

Jaslow Dental Laboratory (hereinafter JDL), the defendant in *Whelan*, is a manufacturer of "dental prosthetics and devices."[9] Rand Jaslow, an shareholder and officer of JDL who had some limited computer experience, attempted to write a computer program which would increase the efficiency of JDL's business operations.[10] After finding that he lacked the ability to create a satisfactory program, Jaslow hired Strohl Systems Group, a custom-software developer, to write the program.[11] The contract provided that Strohl would retain ownership of the software, including the right to sell it to other dental laboratories, and that JDL would receive a 10% royalty on any such sales.[12] Elaine Whelan, a half-owner and officer of Strohl, was to do the work.[13]

Ms. Whelan began by visiting JDL and other dental laboratories for interviews aimed at developing an understanding of the "layout, workflow, and administration of dental laboratories generally."[14] On the basis of this knowledge, she wrote a computer program designed to assist the admin-

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6. *See generally* Gesmer, *Developments in the Law of Computer Software Copyright Infringement*, 26 JURIMETRICS J. 224 (1986); Maier, *supra* note 5; Staines, *supra* note 4; Sutton, *Equities, Evidence, and the Elusive Scope of Copyright Protection for Computer Software*, 1987 J. PAT. OFF. SOC'Y 551.

7. Digital Communications Assoc. v. Softklone Distrib. Corp., 659 F. Supp. 449 (N.D. Ga. 1987); Broderbund Software, Inc. v. Unison World, Inc., 648 F. Supp. 1127 (N.D. Cal. 1986). For discussion of these cases, see *infra* notes 187-216 and accompanying text.

8. *Compare* Whelan Assocs. v. Jaslow Dental Laboratory, 797 F.2d 1222 (3d Cir. 1986) *with* Plains Cotton Coop. v. Goodpasture Computer Serv., 807 F.2d 1256 (5th Cir.), *reh'g denied*, 813 F.2d 407 (5th Cir.), *cert. denied*, 108 S. Ct. 80 (1987) (declining to adopt the *Whelan* position where the structure of the allegedly infringing program was dictated by the subject matter). *Plains Cotton Coop* is discussed *infra* at notes 157-84 and accompanying text.

9. *Whelan Assocs.*, 797 F.2d at 1225.

10. *Id.*

11. *Id.*

12. *Id.* All parties understood that "the operation of dental laboratories was substantially the same throughout the industry and that it would be quite feasible to adapt the system that would be developed for Jaslow Laboratory to many other dental laboratories." Whelan Assocs. v. Jaslow Dental Laboratory, 609 F. Supp. 1307, 1310 (E.D. Pa.), *amended in part*, 609 F. Supp. 1325 (E.D. Pa. 1985), *aff'd*, 797 F.2d 1222 (3d Cir. 1986), *cert. denied sub nom.* Jaslow Dental Laboratory, Inc. v. Whelan Assocs. 479 U.S. 1031 (1987).

13. *Whelan Assocs.*, 797 F.2d at 1225.

istration of the dental laboratory business.[15] She wrote the program, called Dentalab, in EDL (Event Driven Language), the computer language which the JDL computer used.[16] When it was complete, JDL began using Dentalab in its business.[17] Ms. Whelan subsequently left Strohl and formed Whelan Associates, Inc., which acquired Strohl's rights in Dentalab.[18] Whelan Associates entered into a contract with JDL providing for cooperative efforts in marketing Dentalab to other dental laboratories.[19] The agreement provided that JDL would market the program in return for a minority percentage of gross sales, while Whelan Associates would refine and improve the program and would also continue to sell it.[20] The contract was terminable after a year by thirty days notice from either party.[21]

While marketing the program pursuant to the contract, Rand Jaslow discovered that demand for Dentalab was restricted by the fact that many smaller dental laboratories used personal computers incompatible with EDL, the computer language in which Dentalab was written.[22] He began working on a dental laboratory business program he called Dentcom PC, using BASIC, a computer language compatible with most personal computers.[23] To facilitate his work, Jaslow "surreptitiously . . . obtained" a copy of the source code of Dentalab, which the terms of the contracts with Strohl Systems and Whelan Associates forbade him to have.[24] In writing Dentcom, he "attempted to adopt in almost exact duplication all of the functions, the format of the screens, the language and abbreviations, methods of collating, the file structure and work flow" of the Dentalab program.[25] Whelan Associates also developed a BASIC language version of Dentalab for personal computers.[26]

After he essentially completed Dentcom,[27] Rand Jaslow gave Whelan Associates thirty days notice of termination of their contract.[28] Claiming

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15. *Id.* at 1226.
16. *Id.*
17. *Id.*
18. *Id.*
19. *Id.*
20. *Id.*
21. *Id.*
22. *Id.*
23. *Id.*
24. Whelan Assocs. v. Jaslow Dental Laboratory, 609 F. Supp. 1307, 1314 (E.D. Pa. 1985).
25. *Id.*
26. *Id.* at 1316.
27. Jaslow hired a professional programmer to finish the program after working on it for about a year. *Whelan*, 797 F.2d at 1227. The programmer used Jaslow's work, "which [he] found to be the work of a talented but unskilled amateur, containing many errors, and showing a lack of expertise in computer programming and designing." Whelan Assocs. v. Jaslow Dental Laboratory, 609 F. Supp. 1307, 1315 (E.D. Pa. 1985).
28. *Whelan Assocs.*, 797 F.2d at 1226.

that JDL owned exclusive marketing rights to Dentalab, and that Dentalab contained trade secrets belonging to JDL, Jaslow demanded that Whelan Associates respect JDL's marketing rights and not use or disclose its trade secrets.[29] Despite this "thinly veiled threat,"[30] Whelan Associates continued to sell Dentalab.[31]

On the day the contract expired, JDL sued Whelan Associates in a Pennsylvania state court for misappropriation of trade secrets.[32] Rand Jaslow then formed Dentcom, Inc., which began selling both the Dentcom and Dentalab programs to dental laboratories.[33] Whelan Associates responded by filing a copyright infringement suit against JDL, Rand Jaslow, and Dentcom, Inc. in federal court.[34] JDL's trade secret action was removed to federal court and became a counterclaim.[35] Defendants abandoned the claim after the court refused to grant a preliminary injunction forbidding Whelan Associates' alleged use of JDL's trade secrets.[36]

In their answer to Whelan Associates' complaint, the defendants denied that they had copied Dentalab,[37] and asserted that Rand Jaslow had developed Dentcom independently.[38] They also claimed that Whelan Associates' copyright in Dentalab was invalid.[39]

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29. *Id.*
30. *Id.*
31. *Id.* at 1227.
32. *Id.* at 1226-27.
33. *Id.* at 1227.
34. *Id.* Jaslow's partners in the two corporations were also named as defendants. *Id.*
35. *Id.* at 1227-28. Whelan Associates' complaint also alleged that use by Dentcom, Inc. of the terms "Dentalab" and "Dentlab" in connection with its sales violated both state and federal trademark law regarding false designation of origin. *Id.* at 1227. Defendants argued that their use of these terms was not a violation because the terms were merely descriptive. *Id.* In addition, Whelan Associates alleged tortious interference with contractual relations, and each side accused the other of unfair competition. *Id.*
36. *Id.* at 1228.
37. *Id.* at 1227.
38. *Id.* As the Third Circuit noted in its opinion, "independent creation is a complete defense to a claim of copyright infringement." *Id.* at 1227 n.7.
39. *Id.* Defendants argued alternatively that (1) Rand Jaslow was a co-author of Dentalab, so that omission of his name from the registration form was fatal to the copyright, or (2) Rand Jaslow owned Dentalab as a work-made-for-hire, since Elaine Whelan had been employed by him when she wrote the program. *Id.* The Copyright Act of 1976 provides that:
> (a) Initial ownership.—Copyright in a work protected under this title vests initially in the author or authors of the work. The authors of a joint work are coowners of copyright in the work.
> (b) Works Made for Hire.—In the case of a work made for hire, the employer or other person for whom the work was prepared is considered the author for purposes of this title, and unless the parties have expressly agreed otherwise in a written instrument signed by them, owns all of the

At trial, each side called an expert witness to testify concerning the similarities and differences between Dentalab and Dentcom. Plaintiff's expert testified that, while Dentcom was not a "translation" of Dentalab, the two programs were significantly similar in structure.[40] He based this conclusion on a finding that "most of the file structures, and the screen outputs, of the programs were virtually identical," and that five "particularly important 'subroutines' within both programs . . . performed almost identically . . . ."[41] Defendants' expert, however, found that there were many differences between the source and object codes of the two programs,[42] and this indicated that Dentcom was "not directly derived" from Dentalab.[43] He conceded that the two programs had "overall structural similarities."[44]

The district court concluded that defendants had infringed Whelan Associates' copyright, ruling that the copyright was valid, and that Rand Jaslow had not created Dentcom independently.[45] The court based its finding of infringement on its conclusion that Dentcom was substantially similar to Dentalab because its structure and *"overall organization were substantially similar."*[46] The court awarded damages based on sales of Dentcom, and enjoined defendants from any further sales of either program.[47]

The defendants appealed on the issue of whether the district court ruling that Dentcom infringed[48] the Dentalab copyright was erroneous.[49]

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rights comprised in the copyright.

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(d) Transfer of Ownership.—(1) The ownership of a copyright may be transferred in whole or in part by any means of conveyance or by operation of law . . . .

Copyright Act of 1976, 17 U.S.C. § 201 (1982).

40. *Whelan Assocs.*, 797 F.2d at 1228.
41. *Id.*
42. "Source code" and "object code" are defined *infra* note 72.
43. *Id.*
44. *Id.*
45. Whelan Assocs. v. Jaslow Dental Laboratory, 609 F. Supp. 1307, 1320 (E.D. Pa. 1985). The district court ruled that Elaine Whelan was the sole author of Dentalab, and that Strohl had retained (and later assigned to plaintiff) all rights in the Dentalab copyright under the terms of the contract under which the program was written. *Id.* at 1318-19.
46. *Id.* at 1322 (emphasis added).
47. *Id.* at 1322-23.
48. In order to prove copyright infringement a plaintiff must show (1) that she owns the copyright on the work in question, and (2) that defendant copied her copyrighted work. *Whelan Assocs.*, 797 F.2d at 1231; *see, e.g.*, Ferguson v. National Broadcasting Co., 584 F.2d 111 (5th Cir. 1978). While copying can be shown by either direct or circumstantial evidence, the latter is usually employed, since direct evidence to prove copying is seldom available. Roth Greeting Cards v. United Card Co., 429 F.2d 1106, 1110 (9th Cir. 1970). To prove copying by circumstantial evidence, a plaintiff must show (a) access to the copyrighted work on the part of the defendant, and (b) substantial similarity between the copyrighted

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The trial court had based its ruling on the structural similarity of the two programs.[50] As the appellate opinion put it, the appeal therefore presented a "case of first impression in the courts of appeals" which required a decision on "whether the structure (or sequence and organization) of a computer program is protectable by copyright, or whether the protection of the copyright law extends only as far as the literal computer code."[51]

III. HOLDING

In *Whelan*, the Third Circuit reached three conclusions of great significance for copyright infringement cases involving computer software. The central holding was that "copyright protection of computer programs may extend beyond the programs' literal code to their structure, sequence, and organization."[52] This pronouncement, combined with the court's holding that the district court's finding of substantial similarity in structure between the programs at issue was not clearly erroneous, prompted the circuit court to affirm the lower court's ruling that defendants' Dentcom program infringed plaintiff's copyright in Dentalab.

The court also announced two new legal doctrines for application in copyright infringement cases involving computer software. The first of these was a rule for distinguishing the aspects of a computer program which copyright protects from those which it does not. It is a fundamental postulate of intellectual property law that "copyright does not protect ideas, but only expressions of ideas."[53] The new rule provided a basis for differentiating the unprotected ideas in a computer program from the protected expression of those ideas: it distinguished the "end sought to be achieved" or the "purpose or function" of a program from all program aspects "not necessary to that purpose or function."[54]

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work and the allegedly infringed work. *Whelan*, 797 F.2d at 1232; *Ferguson*, 584 F.2d at 113. Some scholars suggest an inverse relationship between the required levels of proof of substantial similarity and access. *See, e.g.*, A. MILLER & M. DAVIS, INTELLECTUAL PROPERTY: PATENT, TRADEMARK AND COPYRIGHT § 22.2, at 331 (1983).

    49. *Whelan Assocs.*, 797 F.2d at 1229.

    50. *Id.*

    51. *Id.* at 1224.

    52. *Id.* at 1248. The Third Circuit gave this issue plenary or de novo review on appeal since it involved solely a question of law. *Id.* at 1233 n.25.

    53. *Id.* at 1234. This doctrine, established in the leading case of Baker v. Selden, 101 U.S. 99 (1879), is now part of the Copyright Act, which provides that "In 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." Copyright Act of 1976, 17 U.S.C. § 102(b) (1982).

    54. *Whelan Assocs.*, 797 F.2d at 1236.

The second new legal doctrine was a one-part test which allowed a finding of substantial similarity between computer programs on the basis of expert testimony alone. This new *Whelan* test replaced the traditional, two-part *Arnstein*[55] test for substantial similarity, which required separate consideration of expert and lay opinion. The district court based its ruling entirely on expert testimony, and the circuit court concluded that such evidence was sufficient for a finding of infringement.

This Comment will discuss these three *Whelan* court conclusions in detail, and survey their application in copyright infringement cases involving computer software since the *Whelan* decision.

IV. LEGAL BACKGROUND

United States copyright law is founded on the patent and copyright clause of the Constitution.[56] It provides that "The Congress shall have Power . . . To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries."[57] Congress most recently exercised its copyright power in the Copyright Act of 1976, which declares that "copyright protection subsists . . . in original works of authorship fixed in any tangible medium of expression, now known or later developed, from which they can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device."[58] Since the Act covers media of expression not yet invented as well as those currently existing, and includes situations where machines aid human perception of the expression, its basic principles extend to computer software.[59] The statutory

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55. The traditional test is set out in the leading case of Arnstein v. Porter, 154 F.2d 464, 468-69 (2d Cir. 1946).

56. U.S. CONST. art. I, § 8, cl. 8.

57. *Id.*

58. Copyright Act of 1976, 17 U.S.C. § 102(a) (1976).

59. Copyright law protects the original expression created by the author of a copyrighted work by granting the author certain exclusive rights, including the right to copy the work, to produce derivative works based on it, and to sell, lease, or transfer copies to the public. *Id.* § 106. In the case of works created after the effective date of the 1976 Act (January 1, 1978), such as the programs at issue in *Whelan*, this limited monopoly lasts for the life of the author plus fifty years. *Id.* §§ 301-05.

Section 106 of the Act, which sets out the author's exclusive rights, reads as follows:

　　Subject to sections 107 through 118, the owner of copyright under this
　　title has the exclusive rights to do and to authorize any of the following:
　　(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

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category to which computer programs belong is that of "literary works."[60]

Congress explicitly included software within the ambit of the Act through passage of the 1980 Computer Software Copyright Act,[61] which amended the Copyright Act of 1976. The 1980 amendments added computer-related language to § 101, and reworded § 117 to allow an owner of a

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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; and

(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.

Id. § 106.

The Act defines "copies" as "material objects, other than phonorecords, in which a work is fixed by any method now known or later developed, and from which the work can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device . . . ." *Id.* § 101. It defines "derivative work" as:

a work based upon one or more preexisting works, such as a translation, musical arrangement, dramatization, fictionalization, motion picture version, sound recording, art reproduction, abridgement, condensation, or any other form in which a work may be recast, transformed, or adapted. A work consisting of editorial revisions, annotations, elaborations, or other modifications which, as a whole, represent an original work of authorship, is a "derivative work".

Id.

Derivative works are also covered by § 103, which provides the following:

(a) The subject matter of copyright as specified by section 102 includes compilations and derivative works, but protection for a work employing preexisting material in which copyright subsists does not extend to any part of the work in which such material has been used unlawfully.

(b) The copyright in a compilation or derivative work extends only to the material contributed by the author of such a work, as distinguished from the preexisting material employed in the work, and does not imply any exclusive right in the preexisting material. The copyright in such work is independent of, and does not affect or enlarge the scope, duration, ownership, or subsistence of, any copyright protection in the preexisting material.

Id. § 103.

60. According to the Act, " 'Literary works' are works, other than audiovisual works, expressed in words, numbers, or other verbal or numerical symbols or indicia, regardless of the nature of the material objects, such as books, periodicals, manuscripts, phonorecords, film, tapes, disks, or cards, in which they are embodied." *Id.* § 101. Since computer programs consist of "words, numbers, or other verbal or numerical symbols," they fall within this definition. Computer disks were included among the expression media covered by this definition in the 1980 "computer amendments" to the Act. 1980 Computer Software Copyright Act, Pub. L. No. 96-517, § 10(a), 94 Stat. 3028 (1980) (codified as amended at 17 U.S.C. §§ 101, 117 (1982)).

61. *Id.*

copy of a program to make a single additional copy or adaptation of the program for archival or computer-use purposes.[62] The amendments followed without variation the recommendations of the National Commission on New Technological Uses of Copyrighted Works (CONTU), which Congress had established to study the relation of new technology and copyright law.[63]

Even after passage of the 1980 amendments, the Copyright Act provided at most a rudimentary outline of how copyright protection might affect computer software. During the 1980s, the federal courts began the task of more clearly defining such protection, through the accretionary process of common law decisionmaking.[64]

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62. Section 117 provides:
[I]t is not an infringement for the owner of a copy of a computer program to make or authorize the making of another copy or adaptation of that computer program provided:
(1) that such a new copy or adaptation is created as an essential step in the utilization of the computer program in conjunction with a machine and that it is used in no other manner, or
(2) that such new copy or adaptation is for archival purposes only and that all archival copies are destroyed in the event that continued possession of the computer program should cease to be rightful . . . .
Copyright Act of 1976, 17 U.S.C. § 117 (1982). Section 117 also allows sale, lease, or other transfer of the additional copy it authorizes, but only as part of transfer of all rights in the program. *Id.* Authorization from the copyright owner is required to transfer an adaptation. *Id.*
In addition to permitting a single user-made copy under certain conditions, § 117 also resolves a copyright problem unique to software. When a computer "runs" or uses a program, it does not remove the program from the medium where it was stored (usually on disk) to the computer's memory, but rather makes a copy of the program in its memory. Although this copy is erased when the computer is turned off, during use of the program it exists long enough to violate the statutory prohibition against copying in at least a technical sense. Section 117 covers this anomaly by allowing the making of a copy "as an essential step in the utilization of the computer program in conjunction with a machine," *id.*, and thus prevents each use of a program from infringing the author's copyright, as it otherwise would.
63. FINAL REPORT OF THE NATIONAL COMMISSION ON NEW TECHNOLOGICAL USES OF COPYRIGHTED WORKS (1978). The Commission had recommended legislation:
(1) to make it explicit that computer programs, to the extent that they embody an author's original creation, are proper subject matter of copyright; (2) to [make the Act] apply to all computer uses of copyrighted programs . . . , and (3) to assure that rightful possessors of copies of computer programs may use or adapt these copies for their use.
Id. at 1.
64. The uncertain parameters of statutory protection led to sharp scholarly debate over whether software can be adequately protected by traditional intellectual property law, or should be the subject of some *sui generis* statutory scheme, analogous to that which Congress enacted for computer semiconductor chips. Semiconductor Chip Protection Act of 1984, 17 U.S.C. §§ 901-14 (Supp. IV 1986); *see, e.g.,* Menell, *Tailoring Legal Protection for Computer Software,* 39 STAN. L.

The courts first considered whether the Copyright Act protects all forms of computer programs.[65] In a series of decisions now referred to as the

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REV. 1329 (1987); Raskind, *The Uncertain Case for Special Legislation Protecting Computer Software*, 47 U. PITT. L. REV. 1131 (1986); Samuelson, *Creating a New Kind of Intellectual Property: Applying the Lessons of the Chip Law to Computer Programs*, 70 MINN. L. REV. 471 (1985). However, the passage of time, the growing body of judicial decisions involving software, and the absence of any congressional move toward such a scheme combine to suggest that, for better or worse, legal protection for software will be governed in large part by traditional copyright concepts as elucidated and elaborated by the federal courts.

This may be a desirable result. As one commentator has pointed out, the common law approach allows the incremental application of collective wisdom, developed by seeking justice in the precise factual circumstances of particular cases, and permits correction of mistakes by distinguishing cases on their facts. Davidson, *Common Law, Uncommon Software*, 47 U. PITT. L. REV. 1037, 1063-70 (1986). As a result, it allows the law to respond to changing circumstances and technological advances. Therefore, development of a coherent and adequate legal policy regarding software may be better accomplished through the common law than the legislative process, which is subject to special-interest, pork-barrel politics, and produces a result frozen in time. Davidson points out that "no one person, or group of persons, is bright enough, farsighted enough and wise enough to integrate the complexity of a new technology like software into our economy. The collective wisdom represented by a myriad of decisions in the common law process, however, contains the intelligence to do just that, justly and wisely." *Id.* at 1070.

Computer software is also protected, in varying degrees, by patent and trade secret law. *See generally* Bender, *Protection of Computer Programs: The Copyright/Trade Secret Interface*, 47 U. PITT. L. REV. 907 (1986); Maier, *Software Protection: Integrating Patent, Copyright and Trade Secret Law*, 69 J. PAT. OFF. SOC'Y 151 (1987); Stern, *The Bundle of Rights Suited to New Technology*, 47 U. PITT. L. REV. 1229 (1986); Stout, *Protection of Programming in the Aftermath of* Diamond v. Diehr, 4 COMPUTER L.J. 207 (1983); Syrowik, *Intellectual Property Rights in Software—A Look at the Basics*, 1986 MICH. B.J. 292; Note, *Protection of Proprietary Rights in Computer Programs: A "Basic" Formula for Debugging the System*, 57 ST. JOHN'S L. REV. 92 (1982).

For discussion of the issues involved in copyright protection of computer software, see generally D. BENDER, COMPUTER LAW: SOFTWARE PROTECTION (1985); T. HARRIS, THE LEGAL GUIDE TO COMPUTER SOFTWARE PROTECTION (1985); D. LONGLEY & M. SHAIN, DICTIONARY OF INFORMATION TECHNOLOGY (2d ed. 1986); A. NIMMER, NIMMER ON COPYRIGHT § 13.01 (1985); J. SOMA, COMPUTER TECHNOLOGY AND THE LAW (1983); Chisum, *The Patentability of Algorithms*, 47 U. PITT. L. REV. 959 (1986); Conley & Bryan, *A Unifying Theory for the Litigation of Computer Software Copyright Cases*, 63 N.C.L. REV. 563 (1985); Davidson, *Common Law, Uncommon Software*, 47 U. PITT. L. REV. 1037 (1986); Desjeux, *From Design to Software: Software, Video Games and Copyright; The Analytical Method in the Test of Technology*, 2 J.L. INFO. SCI. 18 (1986); Gesmer, *Developments in the Law of Computer Software Copyright Infringement*, 26 JURIMETRICS J. 224 (1986); Goldberg, *Computers and Copyright: The Next Generation*, 196 N.Y.L.J., Sept. 19, 1986, at 1, col. 1; Hazen, *Contract Principles as a Guide for Protecting Intellectual Property Rights in Computer Software: The Limits of Copyright Protection, the Evolving Concept of Derivative Works, and the Proper Limits of Licensing Arrangements*, 20 U.C. DAVIS L. REV. 105 (1986); Howe, *Circling the*

"first generation" of software copyright cases,[66] the federal appellate courts

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Wagons: The Industry Is Turning to Litigation in an Attempt to Stem the Hemorrhage of Pirated Intellectual Properties, 32 DATAMATION 42(3) (1986); Maier, *Software Protection: Integrating Patent, Copyright, and Trade Secret Law*, 69 J. PAT. OFF. SOC'Y 151 (1987); Menell, *Tailoring Legal Protection for Computer Software*, 39 STAN. L. REV. 1329 (1987); Pierce, *Copyright Protection for Computer Programs*, 30 COPYRIGHT L. SYMP. 1 (1983); Radcliffe, *Recent Developments in Copyright Law Related to Computer Software*, 4 COMPUTER L. REP. 189 (1985); Raskind, *The Uncertain Case for Special Legislation Protecting Computer Software*, 47 U. PITT. L. REV. 1131 (1986); Raysman & Brown, *Copyright Protection Expanded for Software*, 196 N.Y.L.J., Sept. 10, 1986, at 1, col. 1; Raysman & Brown, *Copyright Protection Extended to a "Total Concept" of Software*, 9 Nat'l L.J., Jan. 26, 1987, at 16, col. 2; Raysman & Brown, *New Regulations Issued for Software*, 197 N.Y.L.J., June 9, 1987, at 1, col. 1; Reback & Hayes, *Copyright Gone Astray: The Misappropriation Alternative*, 3 COMPUTER L. 1 (1986); Russo & Derwin, *Copyright in the "Look and Feel" of Computer Software*, 2 COMPUTER L. 1 (1985); Samuelson, *Creating a New Kind of Intellectual Property: Applying the Lessons of the Chip Law to Computer Programs*, 70 MINN. L. REV. 471 (1985); Schachter, *Software Protection in the Throes of a Legal Morass*, 33 DATAMATION 49(5) (June 1, 1987); Staines, *Idée or idée fixe?*, 50 MOD. L. REV. 368 (1987); Stern, *The Bundle of Rights Suited to New Technology*, 47 U. PITT. L. REV. 1229 (1986); Sutton, *Equities, Evidence, and the Elusive Scope of Copyright Protection for Computer Software*, 69 J. PAT. OFF. SOC'Y 551 (1987); Wharton, *Use and Expression: The Scope of Copyright Protection for Computer Programs*, 6 COMPUTER L.J. 433 (1985); Comment, *Copyright Protection of Software in the EEC: The Competing Policies Underlying Community and National Law and the Case for Harmonization*, 75 CAL. L. REV. 633 (1987); Comment, *Combatting Software Piracy: A Statutory Proposal to Strengthen Software Copyright*, 34 DE PAUL L. REV. 1005 (1985); Comment, *Proving Copyright Infringement of Computer Software: An Analytical Framework*, 18 LOY. L.A. L. REV. 919 (1985); Comment, *Improving the International Framework for the Protection of Computer Software*, 48 U. PITT. L. REV. 1151 (1987); Note, *Copyright Protection for Computer Flow Logic and Algorithms*, 5 COMPUTER L.J. 257 (1984); Note, *Copyright in the Look and "Feel" of Computer Software*, 309 COPYRIGHT & NEW TECH. 181 (1985); Note, *Copyright Infringement of Computer Programs: A Modification of the Substantial Similarity Test*, 68 MINN. L. REV. 1264 (1984); Note, *The Creative Commissioner: Commissioned Works Under the Copyright Act of 1976*, 62 N.Y.U. L. REV. 373 (1987); Note, *Copyright Infringement Actions: The Proper Role for Audience Reactions in Determining Substantial Similarity*, 54 S. CAL. L. REV. 385 (1981); Note, *Defining the Scope of Copyright Protection for Computer Software*, 38 STAN. L. REV. 497 (1986); Note, *The Creative Commissioner: Commissioned Works Under the Copyright Act of 1976*, 62 N.Y.U. L. REV. 373 (1987); Annotation, *Copyright Protection of Computer Programs Under Federal Copyright Laws*, 70 A.L.R. FED. 176 (1984 & Supp. 1987).

    65. The Copyright Act defines "computer program" as follows: "A 'computer program' is a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result." Copyright Act of 1976, 17 U.S.C. § 101 (1982). This definition was part of the 1980 amendments to the Act concerning computer technology. *See* Act of Dec. 12, 1980, Pub. L. No. 96-517, § 10(a), 94 Stat. 3015, 3028 (codified as amended at 17 U.S.C. § 101 (1982)).

    66. Ginsberg, *Computers and Copyright: The Next Generation*, N.Y.L.J., Sept. 19, 1986, p.1, col. 1, at 28, col. 1.

concluded that copyright law protects not only programs written in source code, but also programs written in object code or fixed in semiconductor chips.[67] They also determined that copyright protection extends to both operating system programs and application programs.[68] The basic principle which evolved in these cases is that all computer programs which meet the threshold requirements of the Act can be protected by copyright, regardless of their form, their function, or their fixation in a given medium.[69]

In a small but growing number of "second generation"[70] cases, the courts have begun to face two more difficult issues: the scope of copyright protection for software, and the proper test for infringement in software cases.[71] *Whelan* was the first "second-generation" case requiring resolution of these issues at the appellate level.

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67. *See* Apple Computer, Inc. v. Franklin Computer Corp., 714 F.2d 1240 (3d Cir. 1983), *cert. dismissed*, 464 U.S. 1033 (1984); Williams Elec., Inc. v. Artic Int'l, Inc., 685 F.2d 870 (3d Cir. 1982); Apple Computer, Inc. v. Formula Int'l, Inc., 725 F.2d 521 (9th Cir. 1984). In concluding that copyright protection extends to all forms of computer programs, the courts rejected arguments by some scholars that programs in object code could not be copyrighted because they were useful articles. *See, e.g.*, Samuelson, *CONTU Revisited: The Case Against Copyright Protection for Computer Programs in Machine-Readable Form*, 1984 DUKE L.J. 663.

68. Apple Computer, Inc. v. Franklin Computer Corp., 714 F.2d at 1253.

69. The Act limits copyright protection to "original works of authorship *fixed in any tangible medium of expression*, now known or later developed, from which they can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device." Copyright Act of 1976, 17 U.S.C. § 102 (1982) (emphasis added). According to the Act, "[a] work is 'fixed' in a tangible medium of expression when its embodiment in a copy or phonorecord, by or under the authority of the author, is sufficiently permanent or stable to permit it to be perceived, reproduced, or otherwise communicated for a period of more than transitory duration. . . ." Copyright Act of 1976, 17 U.S.C. § 101 (1982).

70. Ginsberg, *Computers and Copyright: The Next Generation*, N.Y.L.J., Sept. 19, 1986, p.1, col. 1, at 28, col. 1.

71. *See* M. Kramer Mfg. Co. v. Andrews, 783 F.2d 421 (4th Cir. 1986); SAS Inst., Inc. v. S & H Computer Sys., Inc., 605 F. Supp. 816 (M.D. Tenn. 1985); Q-Co Indus., Inc. v. Hoffman, 625 F. Supp. 608 (S.D.N.Y. 1985); Williams v. Arndt, 626 F. Supp. 571 (D. Mass. 1985); E.F. Johnson Co. v. Uniden Corp. of America, 623 F. Supp. 1485 (D. Minn. 1985).

As one observer put it:

> During 1985 software copyright law entered what promises to be a much longer and more difficult phase of its development . . . . [T]he courts have taken the first steps in determining the scope of protection afforded by the copyright in a computer program. These cases hold that copyright protection extends far beyond the literal text of a program's source code to include its structure and organization and the manner in which it operates, controls and regulates a computer.

Gesmer, *Developments in the Law of Computer Software Copyright Infringement*, 26 JURIMETRICS J. 224 (1986).

V. THE SCOPE-OF-PROTECTION DILEMMA

To decide whether copyright protection extends to computer program structure, the Third Circuit had to resolve a dilemma which the program authorial process raised. As the court observed, "the coding process is a comparatively small part of programming. By far the larger portion of the expense and difficulty in creating computer programs is attributable to the development of the structure and logic of the program . . . rather than to the coding."[72] This meant that copyright protection which covered only the written program code would be worth comparatively little. As one commentator has remarked,

> With little understanding of the functional ideas of a program, an infringer can change enough aspects of a program to make it look very different to a lay observer. Even when the program is translated from one computer to another, or one language to another, an infringer can create the new software without first understanding the functional ideas in it (by an 'iterative' process essentially of transcribing it statement by statement). A program which took months or years to develop is then appropriated in days or weeks, leaving the originator little protection or incentive.[73]

Given the amount of time and money which a program's creator must invest in the other steps of writing a program, extending copyright protection

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72. *Whelan Assocs.*, 797 F.2d at 1231. The court found that the process of writing a program consists of four basic steps. *Id.* at 1229. First, the programmer identifies the problem the program is intended to solve, and acquires the information necessary to understand the problem. *Id.* Second, she outlines a solution. *Id.* at 1230. This outline normally takes the form of a flow chart, which may be comprised of several modules or subroutines designed to perform various operations which are part of the solution of the problem. *Id.* Third, the programmer makes decisions concerning data to be used by the program. *Id.* She determines what data are needed by the program, the point during program operation at which the data should be inserted, and how the data should be arranged and combined with other data. This step involves setting up an arrangement of data files within the program for reception and control of the data. *Id.* at 1230, 1242-44. The structure of the program is created by steps two and three. *Id.* at 1230. Fourth, the program structure or design is coded, or translated into a language understood by the computer. *Id.* This step normally has two stages. The programmer translates the program structure into source code, the symbols of a computer language understandable by human programmers and usable with the particular type of computer on which the program is to be used. *Id.* The source code is then translated by another computer program into object code, a binary code made up entirely of "1"s and "0"s which will instruct the computer to perform the functions of the program. *Id.* at 1230-31.

It is now well established that both the source code and object code versions of a program are protected by copyright. The settling of this issue was a major focus of the "first generation" of software copyright cases, discussed *supra* notes 65-69 and accompanying text.

73. Davidson, *Common Law, Uncommon Software,* 47 U. PITT. L. REV. 1037, 1085 (1986).

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to program code alone might well discourage the development of new programs. Such a result would run contrary to a basic purpose of copyright law, the fostering of authorial creativity.[74]

However, the court also had to consider that extension of copyright protection to the structure and logic of programs could embroil the courts in major difficulties. Creation of program structure by a programmer involves not only authorial expression, but use and often generation of ideas. While expression is protectable, ideas themselves are not. Copyright protection for program structure, then, would require a way to distinguish expression from idea in the context of computer software, a context in which many fact finders lack experience. In addition, overzealous protection of program structure could discourage programmers from using the ideas developed in previous programs, for fear of infringement liability. This would also run contrary to a basic purpose of copyright law, enriching society through the spread of knowledge.[75]

The *Whelan* court resolved this dilemma by linking extension of copyright protection to the structure of computer programs with both a rule for distinguishing idea from expression in the software context and a substantial similarity test allowing infringement findings based on expert testimony.

VI. GROUNDS FOR EXTENDING PROTECTION TO PROGRAM STRUCTURE

The court found that copyright protection for software structure was appropriate prima facie because computer programs are classified as literary works under the Copyright Act.[76] It is well established that the copyrights of literary works such as books and plays can be infringed by works which copy their plot structures.[77] Such copying can constitute infringement even where there is no substantial similarity between the literal elements or written expression of the copyrighted and infringing works.[78] By analogy,

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74. *Whelan Assocs.*, 797 F.2d at 1235.

75. *Id.* at 1235.

76. *Id.* at 1234. This classification is supported by the statutory definition of "literary work," 17 U.S.C. § 101 (*see supra* note 60) and by the legislative history of the Copyright Act. *See* H.R. REP. No. 1476, 94th Cong., 2d Sess. 54, *reprinted in* 1976 U.S. CODE CONG. & ADMIN. NEWS 5659, 5667.

77. *Whelan Assocs.*, 797 F.2d at 1234.

78. *Id. See also, e.g.*, Twentieth Century-Fox Film Corp. v. MCA, Inc., 715 F.2d 1327 (9th Cir. 1983) (13 plot similarities between two movies sufficient for finding of copyright infringement); Nichols v. Universal Pictures Corp., 45 F.2d 119 (2d Cir. 1930), *cert. denied*, 282 U.S. 902 (1931) (L. Hand, J.) (established sliding scale for protection of structure, with protection attaching at a point of sufficient complexity and development; protection "cannot be limited literally to the text, else a plagiarist would escape by immaterial variations").

software copyrights could also be infringed by copying program structure.[79]

The court also believed that in granting copyright protection to compilations and derivative works,[80] the Copyright Act of 1976 extended protection to the structure of literary works by implication.[81] Under the Act, a compilation is "a work formed by the collection and assembling of preexisting material or of data that are selected, coordinated, or arranged in such a way that the resulting work as a whole constitutes an original work of authorship."[82] A derivative work is one "based upon one or more preexisting works, such as a[n] . . . abridgment, condensation, or any other form in which a work may be recast, transformed, or ̇adapted."[83] As the court put it,

> it is clear from the definitions of compilations and derivative works, and the protection afforded them, that Congress was aware of the fact that the sequencing and ordering of materials could be copyrighted, i.e., that the sequence and order could be parts of the expression, not the idea, of a work.[84]

The court found further statutory support for extending copyright protection to computer program structure in the legislative history of the 1980 Computer Software Copyright Act.[85] Since Congress adopted the recommendations of the CONTU Report[86] without demur in enacting the 1980 amendments, the Report arguably constituted legislative history for those parts of the Copyright Act which were amended.[87] The Report stated that *"flow charts*, source codes, and object codes are works of authorship in which copyright subsists . . . ."[88]

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79. *Whelan Assocs.*, 797 F.2d at 1234. Using this analogy, a program flow chart is seen as similar to a plot outline.
The court noted that the type of substantial similarity involved is comprehensive nonliteral similarity, a term coined by A. NIMMER, 3 NIMMER ON COPYRIGHT § 13.03[A] (1985), to indicate "a similarity not just as to a particular line or paragraph or other minor segment, but where the fundamental essence or structure of one work is duplicated in another." *Id.* § 13-20.1 The other possible type of substantial similarity noted by Nimmer is fragmented literal similarity. *Id.*
80. Copyright Act of 1976, 17 U.S.C. § 103 (1982).
81. *Whelan Assocs.*, 797 F.2d at 1239.
82. Copyright Act of 1976, 17 U.S.C. § 101 (1982).
83. *Id.*
84. *Whelan Assocs.*, 797 F.2d at 1239.
85. *Id.* at 1241. *See* Pub. L. No. 96-517, § 10(a), 94 Stat. 3015, 3028 (1980) (codified as amended at 17 U.S.C. §§ 101, 117 (1982)).
86. *See supra* note 63 and accompanying text.
87. *See* Micro-Sparc, Inc. v. Amtype Corp., 592 F. Supp. 33, 35 n.7 (D. Mass. 1984). The *Whelan* court rejected defendants' argument that the Report constituted legislative history for any part of the Act not amended, and their contention that it recommended limiting copyright protection to the literal code of computer programs. *Whelan Assocs.*, 797 F.2d at 1241-42.
88. *Id.* at 1241 (quoting the CONTU Report at 21) (emphasis added).

However, the idea/expression dichotomy governs copyright protection of literary works.[89] Consequently, copyright cannot protect the structure of a computer program if it constitutes the idea of the program rather than the expression of that idea.[90] The *Whelan* defendants had argued that, by definition, program structure always constituted idea rather than expression.[91] The Third Circuit rejected this *per se* approach, and constructed a rule to distinguish idea from expression under the facts of particular software cases.[92]

VII. RULE FOR DISTINGUISHING IDEA FROM EXPRESSION IN SOFTWARE CASES

The *Whelan* court derived its new idea/expression rule for computer software cases from *Baker v. Selden*,[93] a leading copyright case involving a book which explained a new method of accounting.[94] The book contained blank forms, consisting of ruled lines and headings, to be employed in using the new accounting method.[95] Plaintiff argued that these forms were part of the copyrightable text of the book, and that defendant had infringed plaintiff's copyright by publishing accounting books including copies of the forms.[96] Defendant argued that the forms were part of the new accounting method which was the idea of plaintiff's book, and hence were not protected.[97] The Supreme Court decided the issue by means of a "necessary incident of the idea" rule, which it expressed as follows: "[W]here the art [the accounting method] it teaches cannot be used without employing the methods and diagrams used to illustrate the book, or such as are similar to them, such methods and diagrams are to be considered as necessary incidents to the art, and given therewith to the public."[98] The court held that the forms were necessary incidents of using plaintiff's

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89. *See supra* note 53 and accompanying text.

90. *Id.* The "first generation" computer software cases had already affirmed that the idea/expression dichotomy applies in the computer context. *See* Apple Computer, Inc. v. Franklin Computer Corp., 714 F.2d 1240, 1252 (3d Cir. 1983); *see also supra* notes 66-69 and accompanying text.

91. *Whelan Assocs.*, 797 F.2d at 1235.

92. *Id.* at 1235-37.

93. 101 U.S. 99 (1879).

94. The *Whelan* court noted that both *Baker* and *Whelan* involved literary works which also had a utilitarian function. *Whelan Assocs.*, 797 F.2d at 1235. The book at issue in *Baker* could be used to execute the new accounting method, since it contained forms for that purpose, and the computer programs at issue in *Whelan* could be used in conjunction with a computer to perform management functions appropriate to a dental laboratory.

95. *Baker*, 101 U.S. at 100.

96. *Id.* at 100-01.

97. *Id.*

98. *Id.* at 103.

method of accounting, and as such were not protected by copyright.[99]

The *Baker* "necessary incident" rule was founded on the fact that the book's idea, the accounting method, could not be expressed without using substantially similar forms. In other words, the expressive and conceptual aspects of the forms had merged. A copyright monopoly in the forms would have conferred a monopoly in the idea itself. If enough other ways of expressing the method had existed, the forms would not have been necessary incidents of the idea.[100]

The Third Circuit saw in the *Baker* rule a way to distinguish idea from expression in the computer software context. In the court's words,

> Just as *Baker v. Selden* focused on the end sought to be achieved by Selden's book, the line between idea and expression may be drawn with reference to the end sought to be achieved by the work in question. In other words, *the purpose or function of a utilitarian work would be the work's idea, and everything that is not necessary to that purpose or function would be part of the expression of the idea. . . . Where there are various means of achieving the desired purpose, then the particular means chosen is not necessary to the purpose; hence, there is expression, not idea.*[101]

As the *Baker* rule had done, the new *Whelan* rule inquired whether other ways to express the idea existed.[102]

The court saw analogous support for its new rule in copyright doctrine affecting *scenes a faire* and fact-intensive works. *Scenes a faire* are "incidents, characters or settings which are as a practical matter indispensable . . . in the treatment of a given topic."[103] Copyright does not protect them because they are essential to the idea or topic involved.[104] Similarly, the literary devices used in fact-intensive works seldom receive copyright protection, because the idea or purpose of a fact-intensive work, conveying of accurate information, can only be accomplished in a limited number of ways.[105]

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99. *Id.* at 104, 106.

100. *See* Continental Casualty Co. v. Beardsley, 253 F.2d 702 (2d Cir.), *cert denied*, 358 U.S. 816 (1958) (insurance forms are copyrightable, but whether a similar form infringes the copyright depends on the degree of possible variation inherent in the subject matter).

101. *Whelan Assocs.*, 797 F.2d at 1236 (first emphasis in original; emphasis of last sentence added).

102. In an important caveat, the court observed that the idea of some utilitarian works such as computer programs might be the execution of "a certain function in a certain way," and that such a program's structure might be essential to its idea. *Id.* at 1238 n.34.

103. Atari, Inc. v. North Am. Philips Consumer Elecs. Corp., 672 F.2d 607, 616 (7th Cir.), *cert. denied*, 459 U.S. 880 (1982) (quoting Alexander v. Haley, 460 F. Supp. 40, 45 (S.D.N.Y. 1978)).

104. *See, e.g.*, Landsberg v. Scrabble Crossword Game Players, Inc., 736 F.2d 485, 489 (9th Cir.), *cert. denied*, 469 U.S. 1037 (1984).

105. 736 F.2d at 488.

The Third Circuit believed that its new *Whelan* rule would further the basic purpose of copyright law, "to create the most efficient and productive balance between protection (incentive) and dissemination of information, to promote learning, culture and development."[106] Although the court admitted that "the economic implications of this rule are necessarily somewhat speculative,"[107] it asserted that the rule would preserve an appropriate balance between competition and protection.[108] On the one hand, the rule would protect a programmer's work in "developing the structure and logic of the program,"[109] which the court saw as a more economically significant part of writing a program than the mere translation of structure into code.[110] At the same time, it would permit use of ideas found in earlier programs, either by expressing the ideas through dissimilar program structures, or by using substantially similar structures where the structure of the original program was necessary to its ideas.[111]

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106. *Whelan Assocs.*, 797 F.2d at 1235.

107. *Id.* at 1237.

108. *Id.* The economic assumptions underlying the rule may be its weakest point. A number of scholars have suggested that economic considerations, and the way in which the computer industry has developed during the 1980s, suggest that traditional copyright protection for software may produce negative social results. *See generally, e.g.*, Menell, *Tailoring Legal Protection for Computer Software*, 39 STANFORD L. REV. 1329 (1987).

109. *Whelan Assocs.*, 797 F.2d at 1237.

110. *See supra* note 72 and accompanying text.

111. In adopting its new rule, *Whelan* rejected three arguments often advanced for limiting copyright protection for computer programs to their literal source and object code. One argument asserted that copying the structure of a computer program requires so much time and effort that it constitutes independent creative work, and that lesser copying efforts would be economically and practically valueless. *See* Note, *Copyright Infringement of Computer Programs: A Modification of the Substantial Similarity Test*, 68 MINN. L. REV. 1264, 1290 (1984). The court replied that (1) copying of program structure in fact could give the copier a significant economic advantage in savings of time and effort, and (2) "[t]he issue in a copyright case is simply whether the copyright holder's expression has been copied, not how difficult it was to do the copying." *Whelan Assocs.*, 797 F.2d at 1237.

The next argument alleged that the concept of program structure was "too vague to be useful in copyright cases." *See* Radcliffe, *Recent Developments in Copyright Law Related to Computer Software*, 4 COMPUTER L. REP. 189, 194-97 (1985). The Third Circuit answered that even though limiting protection to source and object code would "be simpler and would yield more definite answers," such considerations did not outweigh the reasons supporting the extension of protection to program structure. *Whelan Assocs.*, 797 F.2d at 1238.

The third argument contended that the development of knowledge in the computer field requires a greater reliance on previous work than in other fields, and hence a ban on copying should not apply to program structure, lest progress be retarded. *See* Note, *Copyright Infringement of Computer Programs: A Modification of the Substantial Similarity Test*, 68 MINN. L. REV. 1264, 1292 (1984). The court was unconvinced, and observed that "copyright law has always recognized . . . that all intellectual pioneers build on the work of their predecessors." *Whelan*

The court suggested limiting the *Whelan* rule's use to cases involving computer programs or other utilitarian works. It declared that the rule

> has its greatest force in the analysis of utilitarian or "functional" works such as computer programs, for the purpose of such works is easily stated and identified. By contrast, in cases involving works of literature or "non-functional" visual representations, defining the purpose of the work may be difficult. Since it may be impossible to discuss the purpose or function of a novel, poem, sculpture or painting, the rule may have little or not application to cases involving such works.[112]

VIII. APPLICATION OF THE RULE TO THE FACTS OF WHELAN

The court announced that the clear purpose of the Dentalab program was "to aid in the business operations of a dental laboratory."[113] The district court found that there were other programs on the market which had the same purpose but dissimilar structure and organization.[114] The Third Circuit said that this made it "equally clear that the structure of the [Dentalab] program was not essential to [its] task . . . . The conclusion is thus inescapable that the detailed structure of the Dentalab program is part of the expression, not the idea, of that program."[115]

IX. NEW TEST FOR SUBSTANTIAL SIMILARITY IN COMPUTER SOFTWARE CASES

Having concluded that copyright protection extended to the structure and organization of computer programs, the Third Circuit addressed the issue of what constitutes sufficient evidence of substantial similarity capable of supporting a finding that one computer program has infringed the copyright of another.

The traditional test by which courts determine whether two copyrighted works are substantially similar was set out in *Arnstein v. Porter*.[116] The *Arnstein* test requires a two-step process for finding an infringing degree of substantial similarity between the works in question. In the first step, the fact-finder determines whether the degree of similarity between the works supports a conclusion that the alleged infringer copied from the earlier work.[117] For this purpose, expert testimony is admissible.[118] In the

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112. *Id.*
113. *Id.*
114. Whelan Assocs. v. Jaslow Dental Laboratory, 609 F. Supp. 1307, 1320 (E.D. Pa. 1985).
115. *Whelan Assocs.*, 797 F.2d at 1238-39.
116. 154 F.2d 464, 468-69 (2d Cir. 1946).
117. *Id.* at 468.
118. *Id.*

second step, the fact-finder determines whether the infringer copied un-protected or protected elements of the original work; that is, whether the copying was permissible or unlawful.[119] For this purpose, expert testimony is not admissible: the fact finder decides from the perspective of a lay observer.[120]

Two scholars described the reason for the distinction between the two steps as follows:

> [E]xpert testimony is not competent to prove the legal conclusion of infringement, which is entirely for the trier of fact . . . . The issue of illicit as opposed to permissible copying is a matter for the lay observer and not for expert witnesses nor for piece-by-piece analysis of the elements of the two works. Permissible copying includes the taking of ideas; illicit copying appropriates protected expression. The "lay observer" test or "ordinary observer" test is the key to drawing this distinction. The ordinary observer [standard] is similar to the reasonable person standard and is meant to distinguish between those similarities in two works an observer would notice and those the ordinary observer would tend to disregard as immaterial and unrelated to the overall character of the two works.[121]

The Third Circuit concluded, however, that the second step of the *Arnstein* test, the ordinary observer step, was "of doubtful value in cases involving computer programs . . . ."[122] It gave two reasons for this con-clusion. First, unlike novels or plays, computer programs are both complex and unfamiliar to most lay observers.[123] Second, when a computer software infringement case is tried to a judge, as was the case in *Whelan*, the distinction is likely to be meaningless in practice.[124] The court observed that in such situations the judge

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119. *Id.* at 468, 472-73. For example, if defendant's copying constituted "fair use" as defined by the Copyright Act, defendant would not have infringed even though he had copied. *See* 17 U.S.C. § 107 (1982).

120. *Whelan Assocs.*, 797 F.2d at 1232.

121. A. MILLER & M. DAVIS, INTELLECTUAL PROPERTY: PATENTS, TRADEMARKS AND COPYRIGHT § 22.2, at 333-34 (1983) (citations omitted).

122. *Whelan Assocs.*, 797 F.2d at 1232.

123. *Id.* One of the aspects of computer software which presents difficulties for copyright law is the fact that two programs highly dissimilar in both structure and written code can perform the same functions and even produce the same visible output on-screen. *See, e.g.,* Stern Electronics, Inc. v. Kaufman, 669 F.2d 852, 855 (2d Cir. 1982); Midway Mfg. Co. v. Strohon, 564 F. Supp. 741, 749 (N.D. Ill. 1983). This means that programs cannot be compared solely on the basis of what they do or what they look like to the user, but must be compared on the basis of their structure and their code. One commentator notes that asking most judges or juries to compare computer programs on this basis "is roughly analogous to asking a judge or jury with no musical training to base a finding of infringement of a symphony on a comparison of the scores of the two works, without listening to the sounds represented by the notes." Gesmer, *Developments in the Law of Computer Software Copyright Infringement*, 26 JURIMETRICS J. 224, 227 (1986).

124. *Whelan Assocs.*, 797 F.2d at 1232-33.

has been exposed to expert evidence in the first step, yet she or he is supposed to ignore or "forget" that evidence in analyzing the problem under the second step. Especially in complex cases, we doubt that the "forgetting" can be effective when the expert testimony is essential to even the most fundamental understanding of the objects in question.[125]

Accordingly, the court followed the lead of a number of federal district courts,[126] and explicitly adopted a one-step substantial similarity test which allows a finding of substantial similarity between computer programs based on expert testimony.[127] Since it took this view, the Third Circuit declined to invalidate the lower court's finding of substantial similarity even though that court had not followed the *Arnstein* test.[128]

A. *Types of Evidence Which Can Satisfy The Test*

The Third Circuit held that the district court finding of substantial similarity between the Dentalab and Dentcom programs was not clearly erroneous.[129] The appellate opinion therefore did not provide a comprehensive list of the types of evidence which could support a finding of substantial similarity between computer programs.[130] However, its holding

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125. *Id.*

126. *See, e.g.,* E.F. Johnson Co. v. Uniden Corp. of America, 623 F. Supp. 1485, 1493 (D. Minn. 1985); Midway Mfg. Co. v. Strohon, 564 F. Supp. 741, 752-53 (N.D. Ill. 1983).

127. *Whelan Assocs.,* 797 F.2d at 1233. The new *Whelan* test allows both lay and expert testimony. However, the court's approval of both of the earlier district court cases and of the lower court finding of substantial similarity in *Whelan* based on expert testimony, make it clear that the one-step test allows a finding of substantial similarity based on expert testimony alone. *Id.* The one-step *Whelan* test finds support in the Federal Rules of Evidence. The Rules provide that "If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert . . . may testify thereto in the form of an opinion or otherwise." FED. R. EVID. 702. The Rules also state that "testimony in the form of an opinion or inference otherwise admissible is not objectionable because it embraces an ultimate issue to be decided by the trier of fact." FED. R. EVID. 704.

128. *Id.* at 1232 (even though the district court did not "bifurcate its analysis," thus appearing to "have contravened the law of this circuit," it had applied the appropriate standard).

129. Since this issue involved questions of fact, the "clearly erroneous" standard of review applied. *Id.* at 1233 n.25.

130. One expert on computer software copyright issues has offered a taxonomy of substantial similarity evidence which may aid in understanding *Whelan* and succeeding cases. Davidson, *Common Law, Uncommon Software,* 47 U. PITT. L. REV. 1037, 1085-92 (1986). He would relabel the substantial similarity test as a "surprising similarity test," suggesting that "to determine underlying similarity, find evidence which reflects a surprising, improbable number of similar discretionary choices between two programs which are supposed to share only functional similarities." *Id.* at 1086. This evidence could be of three types: striking literal similarity,

necessarily implied that the types of evidence which the district court considered belong on such a list.

There were three types of evidence of substantial similarity between the programs at issue in *Whelan*: that which showed similarity between the programs' file structures, their screen outputs, and some of their important subroutines. Since the court concluded that infringement had occurred in *Whelan*, these types of evidence are likely to be important in future cases.

1. File Structures

Computer program file structures are places within the program where data input from the program user is stored. The court compared file structures to manila folders in file drawers, or to "a very complex cataloguing structure like the structure of Lexis or Westlaw without any entries yet made."[131]

The *Whelan* defendants had argued that because file structures are analogous to the blank accounting forms in *Baker v. Selden*,[132] they are

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surprising nonliteral similarity, and suspicious conduct.

Striking literal similarity, the equivalent of Nimmer's fragmented literal similarity, *see supra* note 79, would exist where at least a small part of the allegedly infringing program was copied literally. Since computer syntax and functional similarity between programs can lead two programmers to write similar code, this copied fragment would have to be "strikingly similar." Davidson, *supra*, at 1086. An example would be where programmer "A" included his initials in a nonfunctional comment line of his program, and programmer "B" copied the line including the initials.

Surprising nonliteral similarity, the equivalent of Nimmer's comprehensive nonliteral similarity, *see supra* note 79, would be found

> where the infringer made too many of the same discretionary programming choices. . . . The choices of the infringer that should be compared with those of the original program are the manner of expressing the transactions, functions and algorithms accomplished by each subprogram (*i.e.*, the manner of expressing the ideas in the program).

Davidson, *supra*, at 1086. Davidson suggests eight points of comparison, including (1) the non-functional, stylistic aspects of the program code, (2) the sequence of program statements, (3) the degree to which subroutines optimally implement their functions, (4) "kludges," or the degree to which subroutines eccentrically implement their functions, (5) nonstandard algorithms or programming techniques (less likely than standard algorithms to have come from the public domain), (6) the sequence of subroutines, (7) the selection of subroutines (like paragraphing, the choice of how many subroutines to use is a matter of personal style), and (8) the data structure of the programs. Davidson, *supra*, at 1086-88. Davidson's suggestions regarding conduct evidence are discussed *infra* notes 148-49 and accompanying text.

131.   *Whelan Assocs.*, 797 F.2d at 1242.

132.   101 U.S. 99 (1879). *Baker* is discussed *supra* notes 94-99 and accompanying text.

not protected by copyright.[133] If this were true, evidence of file structure similarity could never prove infringement. However, the Third Circuit declared the majority rule on the issue to be that "blank forms may be copyrighted if they are sufficiently innovative that their arrangement of information is itself informative."[134] It found that the Dentalab file structures were in fact "sufficiently informative to deserve copyright protection."[135]

The opinion acknowledged that "for certain tasks there are only a very limited number of file structures available, and in such cases the structures might not be copyrightable and similarity of file structures might not be strongly probative of similarity of the program as a whole."[136] However, the evidence in *Whelan* showed that the idea of the Dentalab program, the business management of a dental laboratory, could be expressed by other programs using "significantly different file structures."[137]

The *Whelan* approach to file structure evidence can be summarized as follows: if the file structures are informative enough in themselves to qualify for copyright protection, and if they are not an essential means of achieving a particular function (which would make them necessary incidents of the idea involved), evidence that the file structures of two programs are similar can be used to show substantial similarity between the programs and thus help to prove infringement. One implication for future cases is that file structure similarity evidence is most likely to be admitted to show substantial similarity between programs where a plaintiff can show that dissimilar file structures can achieve the same result.

2. Screen Outputs

Screen outputs are the images a computer program places on the computer screen to communicate with the program user. Obviously, the program causes the images, and an infringing program might produce screen images like those of the program it copied as a result of the copying. The problem with using similarity of screen outputs to prove substantial similarity between programs is that two programs highly dissimilar in both structure and written code can produce the same visible screen output.[138] Screen output evidence thus presents a basic admissibility question: does the probative value of such evidence outweigh the risk that it will unfairly

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133. *Whelan Assocs.*, 797 F.2d at 1242.
134. *Id.* at 1243.
135. *Id.*
136. *Id.* at 1243 n.43.
137. *Id.* at 1243.
138. *See, e.g.*, Stern Electronics, Inc. v. Kaufman, 669 F.2d 852, 855 (2d Cir. 1982); Midway Mfg. Co. v. Strohon, 564 F. Supp. 741, 749 (N.D. Ill. 1983). The *Whelan* opinion acknowledged this fact. *Whelan Assocs.*, 797 F.2d at 1244 n.45.

prejudice the trier of fact in that it is more vivid and understandable than other, more technical evidence?[139] The *Whelan* court recognized this risk, but noted that "[s]creen outputs are not so enticing that a trier of fact could not evaluate them rationally and with a cool head."[140] The Third Circuit Court of Appeals seemed impressed by the potential prejudice involved. It appears to have approved the lower court's admission of screen output similarity evidence primarily on the basis of the substantial deference normally accorded trial court decisions on admissibility.[141] It seems likely that courts will limit the role of such evidence in future cases to confirming other evidence of substantial similarity.

3. Subroutines

The court defined "subroutine" as a discrete module or part of a program with a readily identifiable task.[142] The evidence at trial had shown similarity between five important subroutines in the two programs at issue.[143]

Defendants argued on appeal that "one cannot prove substantial similarity of two works without comparing the entirety, or at least the greater part, of the works."[144] They asserted that similarity between these subroutines was not sufficient to show similarity between the programs as a whole, and that structural similarity could not be established by comparing "only a small fraction of the two works."[145]

The court rejected this argument as contrary to traditional copyright doctrine. It declared that

> There is no general requirement that most of each of two works be compared before a court can conclude that they are substantially similar. In the cases of literary works—novels, movies, or plays, for example—it is often impossible to speak of "most" of the work. The substantial similarity inquiry cannot be simply quantified in such instances. Instead, the court must make a qualitative, not quantitative, judgment about the character of the work as a whole and the importance of the substantially similar portions of the work. Computer programs are no different. Because all steps of a computer program are not of equal importance, the relevant inquiry cannot therefore be the purely mechanical one of whether most

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139. *Id.* at 1244.
140. *Id.* at 1245.
141. *Id.* One member of the Third Circuit panel concluded that it was error to admit such evidence, but that reversal was not required because the error was harmless, given the convincing nature of the other evidence. *Id.* at 1244 n.45.
142. *Id.* at 1230 n.15.
143. *Id.* at 1228. The five subroutines handled "order entry, invoicing, accounts receivable, end of day procedure and end of month procedure." *Id.* The trial court had accepted the conclusion of plaintiff's expert that the five subroutines "performed almost identically." *Id.*
144. *Id.* at 1245.
145. *Id.*

of the programs' steps are similar. Rather, because we are concerned with
the overall similarities between the programs, *we must ask whether the
most significant steps of the programs are similar.*[146]

Whelan thus appears to stand for the proposition that evidence of
similarity between qualitatively significant subroutines in two programs may
be enough to establish substantial structural similarity between the programs
as a whole. This would prove infringement even where the similar parts
represent a quantitatively small portion of the programs in question. The
body of case authority which the *Whelan* court cited suggests that this is
in fact well settled, and that the *Whelan* decision did not bend traditional
doctrine as some writers have asserted.[147]

X. POSSIBLE INFLUENCE OF DEFENDANT CONDUCT ON THE SUBSTANTIAL SIMILARITY ISSUE

A number of commentators have suggested that the *Whelan* defendants'
conduct may have been a powerful but unmentioned factor in the Third
Circuit's decision.[148] As one observed, "Inferences from conduct alone may
not provide sufficient evidence of underlying similarity, and may be re-
buttable. . . . When coupled with other evidence, however, like too many
similar discretionary programming choices, it can make a case of underlying
similarity overwhelming."[149] A review of the facts in *Whelan* makes it clear
that defendant's conduct was improper and unfair in several respects.[150]
Rand Jaslow's improper access to the Dentalab source code,[151] uncontested

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146. *Id.* at 1245-46 (citations omitted) (emphasis added).

147. *See, e.g.*, Goldberg, *Computers and Copyright: The Next Generation,*
N.Y.L.J., Sept. 19, 1986, at 1, col. 1, at 28, col. 2 ("Departing from the general
rule that a relatively substantial quantity of a utilitarian work must be copied
before infringement is found, the Third Circuit held that substantial similarity, and
hence infringement of a computer program, can be based on the taking of a
quantitatively small, but qualitatively important portion of a protected program")
(emphasis in original).

148. *See, e.g.*, Conley & Bryan, *A Unifying Theory For the Litigation of
Computer Software Copyright Cases,* 63 N.C.L. REV. 563 (1985); Davidson, *Com-
mon Law, Uncommon Software,* 47 U. PITT. L. REV. 1037 (1986); Gesmer, *De-
velopments in the Law of Computer Software Copyright Infringement,* 26 JURIMETRICS
J. 224 (1986); Raysman & Brown, *Copyright Protection Extended to a "Total
Concept" of Software,* 9 Nat'l L.J., Jan. 26, 1987, at 16, col. 2.; Staines, *Idée
or idée fixe?,* 50 MOD. L. REV. 368 (1987).

149. Davidson, *Common Law, Uncommon Software,* 47 U. PITT. L. REV.
1037, 1088-89 (1986).

150. *See supra* notes 9-33 and accompanying text. Indeed, it appears that an
attorney hoping to persuade a court to extend copyright protection to computer
program structure could hardly have wished for a more favorable set of facts.

151. Whelan Assocs. v. Jaslow Dental Laboratory, 609 F. Supp. 1307, 1321
(D.C. Pa. 1985).

on appeal,[152] could have been particularly influential, since some courts may tend to require less evidence of substantial similarity when strong evidence of defendant access to plaintiff's work is present.[153] Other recent copyright infringement cases involving computer software have also involved defendant misconduct,[154] and two scholars have suggested that the conduct of alleged infringers should be the principal focus in such cases.[155] Evidence concerning the fairness or unfairness of the parties' conduct may prove important in future cases as well.

XI. APPLICATION OF THE WHELAN DECISION IN LATER CASES

The Third Circuit's decision in *Whelan* has already influenced the outcome of three later reported decisions in computer software copyright cases.[156] In these cases, the Fifth Circuit and two federal district courts considered the implications and explored the boundaries of the *Whelan* decision.

A. *Skepticism from a Sister Circuit*

In *Plains Cotton Cooperative v. Goodpasture Computer Service*,[157] the Fifth Circuit upheld denial of a preliminary injunction against alleged

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152. *Whelan Assocs.*, 797 F.2d at 1229.

153. *See supra* note 48.

154. *See* SAS Inst. v. S & H Computer Sys., Inc., 605 F. Supp. 816 (M.D. Tenn. 1985) (defendant obtained a license for plaintiff's source code for the purpose of creating a competing program for a different computer); Williams v. Arndt, 626 F. Supp. 571 (D. Mass. 1985) (defendant obtained one of limited number of copies of plaintiff's book on commodities trading, promising to write a program based on the book for sole use of purchaser of the copy borrowed, but instead programmed for public sale as unauthorized computer version of plaintiff's book).

155. Conley & Bryan, *A Unifying Theory for the Litigation of Computer Software Copyright Cases*, 63 N.C.L. REV. 563 (1985).

156. *See infra* notes 157-216 and accompanying text. Three other cases have also cited *Whelan* on fairly minor points not involving the scope of copyright protection for computer software. *See* Easter Seal Society v. Playboy Enterprises, 815 F.2d 323, 329 (5th Cir.), *reh'g denied*, 820 F.2d 1223 (5th Cir. 1987), *cert. denied*, 108 S. Ct. 1280 (1988) (*Whelan* cited as supporting authority for literal interpretation of statutory definition of "work for hire"); Lasercomb America, Inc., v. Holiday Steel Rule Die Corp., 656 F. Supp. 612, 615-16 (M.D.N.C.), *appeal dismissed*, 829 F.2d 36 (4th Cir. 1987) (rejecting defendant's contention that its copying was permissible as the creation of its own product via a laborious, expensive process, based on the *Whelan* statement that because copying required great effort by the copier does not mean the copying does not infringe) (summary judgment on the issue of software copyright infringement was appropriate where defendant's brief admitted a conclusion by defendant's experts that the two programs could not have been independently written); Original Appalachian Artworks, Inc. v. J.F. Reichert, Inc., 658 F. Supp. 458, 466 (E.D. Pa. 1987) (*Whelan* cited as authority that proper limits of judicial discretion on awarding recovery of costs and attorneys' fees remain unclear, with little guidance from case law).

157. 807 F.2d 1256 (5th Cir. 1987)

infringement of copyright in a computer program designed to assist farmers in marketing cotton.[158] The program, called Telcot, was usable on terminals connected to the Cooperative's mainframe computer, but not on personal computers.[159]

The four Cooperative employees who had written Telcot later left the Cooperative for Commodity Exchange Service Company (CSX), taking with them a copy of the Telcot source code.[160] While employed by CSX,[161] they designed a personal-computer version of Telcot.[162] CSX then went bankrupt, and Goodpasture Computer Service hired the four men. Goodpasture knew about their work on a Telcot clone,[163] and had the four sign agreements not to breach any "confidences of their former employers" during work at Goodpasture.[164] After working for Goodpasture for only 20 days, the four men completed "a personal computer version of a cotton exchange program" called GEMS, which Goodpasture began selling in incomplete form less than a year later.[165] The Cooperative sued both Goodpasture and the four employees, alleging that GEMS infringed Telcot's copyright.[166]

The Cooperative sought a preliminary injunction prohibiting sale of GEMS.[167] It presented evidence that GEMS was "very similar to Telcot on the functional specification, programming, and documentation levels."[168] Plaintiff's expert testified that "the similarities in the two [programs] were sufficient as a basis for his opinion that defendants had copied plaintiff's [program]."[169] However, the four employees alleged that they had not copied Telcot, but that in writing GEMS they "drew on their knowledge

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158. *Id.* at 1257-58. Plaintiff's program, called Telcot, was "designed to provide [the Cooperative's] members with information regarding cotton prices and availability, with accounting services, and with the capability to consummate actual sales electronically." *Id.* at 1258.

159. *Id.*

160. *Id.*

161. On leaving the Cooperative, the four were employed by Commodity Exchange Service Company, which had contracted with the Cooperative for development of a personal computer version of Telcot. *Id.* That contract was terminated shortly after the four men changed employers. *Id.*

162. *Id.*

163. *Id.*

164. *Id.* One of the employees violated this agreement by bringing with him a computer disk containing Telcot programming designs, and was later fired for having done so. *Id.* at 1259.

165. *Id.*

166. The Cooperative also alleged that Goodpasture had misappropriated its trade secrets, gaining access to them through these employees. The district court ruled that plaintiffs had not established substantial likelihood of success on the merits on this point. *Id.* at 1259, 1262-64.

167. *Id.* at 1257, 1259.

168. *Id.* at 1259. Several pages of the GEMS design manual were directly copied from the Telcot design manual. *Id.*

169. *Id.* at 1260 n.1.

of the cotton industry and expertise in computer programming and design gained over a number of years.''[170] Defendants' expert testified that Telcot was "too large to have been copied and modified in the amount of time [the employees] took to create GEMS," and that the employees could have "take[n] their knowledge of the cotton industry and ... recreate[d] a similar vehicle.''[171] In his opinion, the many differences between the two programs indicated that defendants had not copied Telcot.[172]

The district court ruled that plaintiff had not established substantial likelihood of success on the merits,[173] in that the evidence did not demonstrate enough similarity between the two programs to make an infringement finding at trial probable.

Plaintiff appealed, arguing that the district court erred as a matter of law in not considering evidence of substantial similarity between the structure of the two programs.[174] Plaintiff cited *Whelan* as authority for the view that copyright protection extends to program structure, and urged the court to adopt the Third Circuit's reasoning on that issue.[175]

The Fifth Circuit declined to follow *Whelan*, at least at the preliminary stage of litigation presented in *Plains Cotton*.[176] One of its two reasons for doing so was that the record available on pretrial review of the injunction denial was necessarily less than complete.[177] The other was that, in the circumstances of the case, the structure of plaintiff's program could represent idea rather than expression and thus fail to qualify for protection.[178]

At first glance, the *Plains Cotton* opinion appears to indicate a Fifth Circuit rejection of the *Whelan* premise that copyright can protect the structure of a program.[179] However, a closer look reveals that such a conclusion would be overhasty.

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170. *Id.* at 1259.
171. *Id.* at 1260.
172. *Id.* at 1260 n.1.
173. *Id.* at 1259. The district court also based denial of the injunction on failure to establish substantial likelihood of irreparable injury, since the court believed any injury to plaintiffs would be compensable in damages under the circumstances of the case. *Id.* at 1261.
174. *Id.* at 1260, 1261-62.
175. *Id.* at 1262.
176. *Id.*
177. *Id.*
178. *Id.*
179. The Fifth Circuit announced that it looked to Synercom Technology, Inc. v. University Computing Co., 462 F. Supp. 1003 (N.D. Tex. 1978), decided by one of its own district courts, for guidance on the issue of protection for program structure. *Plains Cotton*, 807 F.2d at 1262. It apparently viewed *Synercom* as suggesting that the copyrightability of sequence and form should be treated differently in a computer context than in any other, a position rejected by *Whelan*. *Plains Cotton*, 807 F.2d at 1262 (citing *Whelan Assocs.*, 797 F.2d at 1240). This view of *Synercom* is open to criticism. The *Synercom* court held only that input formats like those at issue before it were unprotected, not that all forms of computer program structure were unprotected. *Synercom*, 462 F. Supp. at 1014.

The record on appeal in *Plains Cotton* included evidence that "many of the similarities between the GEMS and Telcot programs [were] dictated by the externalities of the cotton market."[180] Accordingly, the Fifth Circuit "decline[d] to hold that those [market] patterns cannot constitute 'ideas' in a computer context."[181] These statements imply that the court believed the idea of presenting cotton marketing information in a computer program might only be expressible through substantially similar program structures. If that proved true, the structure needed would be a "necessary incident" of the idea, and would not be protected by copyright.[182]

Such a conclusion is entirely consonant with the *Whelan* rule for distinguishing idea from expression in computer software cases.[183] The Third Circuit's finding that copyright protected the program structure in *Whelan* depended on a conclusion that it was not a necessary part of the idea of that program.[184] Since *Plains Cotton* appeared potentially distinguishable from *Whelan* on this point, the Fifth Circuit could have reached the result it wanted in *Plains Cotton* by applying *Whelan* rather than declining to adopt it.

It thus appears that, contrary to first appearances, *Plains Cotton* need not be viewed as creating a conflict among the circuits on whether copyright protects the structure of software. Rather, *Plains Cotton* reemphasizes the highly fact-dependent, case-specific nature of such protection. The Fifth Circuit's position appears reconcilable with that of the Third Circuit in *Whelan*: when the structure of a computer program represents expression rather than idea, it is protected by copyright. While this may leave the software world to the unpredictable application of the *Whelan* rule distinguishing idea and expression, such uncertainty may be the price for shelter under a copyright umbrella. The idea/expression dichotomy has always defied easy or predictable application in individual cases.[185]

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180. *Plains Cotton*, 807 F.2d at 1262.
181. *Id.*
182. *See supra* notes 99-100 and accompanying text.
183. *See supra* notes 93-112 and accompanying text.
184. *See supra* notes 113-115 and accompanying text.
185. No less a copyright authority than Judge Learned Hand observed:
It is of course essential to any protection of literary property, whether at common law or under the statute, that the right cannot be limited literally to the text, else a plagiarist would escape by immaterial variations. That has never been the law, but, *as soon as literal appropriation ceases to be the test, the whole matter is necessarily at large*, so that . . . the decisions cannot help much in a new case. . . .
[W]hen the plagiarist does not take out a block in situ, but an abstract of the whole, decision is more troublesome. Upon any work . . . a great number of patterns of increasing generality will fit equally well, as more and more of the incident [the literal verbal expression] is left out. The last may perhaps be no more than the most general statement of what the [work] is about, and at times might consist only of its title; but there

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B. *Conflict Over Scope of Protection and Screen Displays*

The *Whelan* opinion treated similarity between screen displays as corroborative evidence of substantial structural similarity between computer programs, and paid considerable respect to the admissibility problems which such evidence raise.[186] Two subsequent cases in the federal district courts have treated the issue of whether copyright protection extends not only to computer program structure but also to the screen displays the programs generate. They reached contrary conclusions.

Broderbund Software, Inc. v. Unison World, Inc.[187] was an copyright infringement action by the owners of Print Shop, a popular home printing program enabling personal computer users to "create customized greeting cards, signs, banners, and posters," against the owners of Printmaster, a program performing similar functions.[188] Plaintiff alleged that "the overall appearance, structure, and sequence of the audiovisual displays" generated by Printmaster infringed the Print Shop's copyright.[189]

Unison World's primary business was converting existing computer programs into versions for different computers. Broderbund asked Unison World to develop an IBM-compatible version of Print Shop, which was then available only in an Apple computer version.[190] Because Broderbund wanted an exact reproduction, Unison World programmers attempted to duplicate the Print Shop program as exactly as possible.[191] When negotiations between plaintiff and defendant over ownership of the rights to the IBM version broke down, Unison World programmers turned their efforts to developing an "enhanced" version of Print Shop which improved on the original.[192] In this process, defendant's programmers kept the parts of Print Shop they had already incorporated into their work, including the a considerable number of screen display designs, including the menu screens, which present program commands for user selection, and various screens within the greeting card, sign, and picture editor portions of the program.[193] After the programers added some original features, defendants marketed

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is a point in this series of abstractions where they are no longer protected, since otherwise the [author] could prevent the use of his "ideas," to which, apart from their expression, his property is never extended. *Nobody has ever been able to fix that boundary, and nobody ever can.*

Nichols v. Universal Pictures Corp., 45 F.2d 119, 121 (2d Cir. 1930) (L. Hand, J.), *cert. denied*, 282 U.S. 902 (1931) (citations omitted) (emphasis added).

186. *See supra* notes 138-41 and accompanying text.
187. 648 F. Supp. 1127 (N.D. Cal. 1986).
188. *Id.* at 1129-30.
189. *Id.*
190. *Id.* at 1130.
191. *Id.* at 1131.
192. *Id.*
193. *Id.*

their work under the name of Printmaster.[194] Plaintiff's suit followed.

Defendant argued that "the idea underlying the menu screens, input formats, and sequencing of screens in 'Print Shop' [was] indistinguishable from its expression."[195] It asserted that there was "no other conceivable way to structure" a program fulfilling the same functions.[196] Plaintiff introduced another competing program, Stickybear Printer, which performed similar functions but had very different menu screens and screen sequences.[197] That evidence convinced the court that the idea and expression of Print Shop were distinguishable from one another.[198]

While defendant cited earlier authority[199] to establish that only the source and object codes of computer programs are protected by copyright, plaintiff cited *Whelan* as extending protection beyond these literal program elements.[200] The district court read *Whelan* as "stand[ing] for the proposition that copyright protection is not limited to the literal aspects of a computer program, but rather that it extends to the overall structure of a program, *including its audiovisual displays*."[201] It applied the *Whelan* rule for distinguishing idea from expression in the software context, and concluded that "the separable idea of 'Print Shop' is the creation of greeting cards, banners, posters and signs that contain infinitely variable combinations of text, graphics, and borders."[202] It ruled that the existence of Stickybear Printer demonstrated that this idea could be expressed through different screen display structures, and that therefore Print Shop's screen displays were protected by copyright in the program itself.[203]

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194. *Id.*
195. *Id.* at 1132.
196. *Id.*
197. *Id.*
198. *Id.* at 1132-33.
199. Synercom Technology, Inc. v. University Computer Co., 462 F. Supp. 1003 (N.D. Tex. 1978).
200. *Broderbund*, 648 F. Supp. at 1132.
201. *Id.* at 1133 (emphasis added).
202. *Id.*
203. *Id.* The court also ruled that the design of Print Shop's screen displays was based on artistic rather than utilitarian considerations, a fact which preserved the expressive character of the design; that copyright protection for the menu screens was not barred by the "rules and instructions doctrine"; that the copyright notice included in Print Shop's visual display sequence was statutorily adequate. *Id.* at 1133-35.

The court found both direct and circumstantial evidence indicating that defendant had copied plaintiff's work. *Id.* at 1135. Although the direct evidence was sufficient to establish copying, the opinion also discussed the circumstantial evidence in the interest of completeness. *Id.* at 1136-37. Interestingly, since it had cited *Whelan* for its earlier conclusion on the scope of protection, the court made no mention of *Whelan*'s one-part, expert-opinion-based test for substantial similarity, but found such similarity on the basis of the traditional *Arnstein* two-part test involving an "ordinary reasonable person" perspective. *Id.* at 1136-37. The *Arnstein*

Digital Communications Associates v. Softklone Distributing Corporation[204] was a suit by the owners of the copyright for Crosstalk XVI, a popular communications programs for personal computers, against Mirror, a similar program which defendants sold as a Crosstalk XVI clone. The part of Mirror over which Crosstalk XVI's owners sued was its status or main command menu screen.[205] Mirror's owners claimed that such screens were not protected by copyright. Plaintiff claimed that defendant had copied its Crosstalk XVI status screen, and that the plaintiff's copyright protected the screen.[206]

The federal district court cited *Whelan* as the leading case on the scope of copyright protection for computer programs.[207] While the court read *Whelan* as extending copyright protection to program structure, it observed that "[w]hile finding that copying of a program's screen displays may serve as indirect evidence of copying of a program, the *Whelan* court did not specifically extend a computer program's copyright protection to its screen displays."[208] The *Digital* court also noted that *Broderbund* had "gone a step further than *Whelan* and ha[d] concluded that a computer program's copyright protection extends to its audiovisual screen displays."[209]

The *Digital* opinion concluded that *Broderbund*'s reading of *Whelan* was "overexpansive and erroneous," because *Whelan* "dealt only with the *evidentiary* use of the copying of screen displays for the purpose of establishing copying of the underlying computer program."[210] In the *Digital* court's view, *Whelan* "did not stand for the proposition that screen displays

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test is discussed *supra* notes 115-20 and accompanying text; the *Whelan* test is discussed *supra* notes 121-27 and accompanying text. The *Broderbund* court apparently believed that the screen display evidence was understandable by lay fact finders, and thus the expert-based test was not needed. As the court put it, "the ordinary observer could hardly avoid being struck by the eerie resemblance between the screens of the two programs." *Id.* at 1137.

204.   659 F. Supp. 449 (N.D. Ga. 1987).
205.   *Id.* at 452-53.
206.   The Copyright Act of 1976 defines "audiovisual works" as:
works that consist of a series of related images which are intrinsically intended to be shown by the use of machines or devices such as projectors, viewers, or electronic equipment, together with accompanying sounds, if any, regardless of the nature of the material objects, such as films or tapes, in which the works are embodied.
Copyright Act of 1976, 17 U.S.C. § 101 (1982). Copyright subsists in such works under the provisions of the Act. *Id.* § 102(a)(6). Several appellate decisions have approved copyright protection of computer program screen displays as audiovisual works. *See, e.g.,* Williams Electronics, Inc. v. Arctic Int'l, Inc., 685 F.2d 870 (3d Cir. 1983); Stern Electronics, Inc. v. Kaufman, 669 F.2d 852 (2d Cir. 1982).
207.   *Digital,* 659 F. Supp. at 455.
208.   *Id.*
209.   *Id.* (citing Broderbund Software, Inc. v. Unison World, Inc., 648 F. Supp. 1127 (N.D. Cal. 1986)).
210.   *Id.*

are protected by the computer program's copyright from copying."[211]

The *Digital* court expressly rejected the conclusion reached in *Broderbund*, and held that copyright protection for a computer program does not extend to the screen displays generated by the program.[212] As the court put it,

> [S]creen displays generated by computer programs are not direct "copies" or "reproductions" of the literary or substantive content of the computer programs. This distinction results from the fact that the same screen can be created by a variety of separate and independent computer programs. It is somewhat illogical to conclude that a screen can be a "copy" of many different programs. Therefore, it is this court's opinion that a computer program's copyright 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.[213]

Accordingly, the court ruled that the Mirror status screen did not infringe plaintiff's copyright in the Crosstalk XVI program.[214]

This holding includes program "sequence, organization or structure" with program source and object code in the list of program elements protected by copyright.[215] Clearly, the *Digital* court accepted *Whelan* on that point.[216]

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211. *Id.*

212. *Id.* at 455.

213. *Id.* at 455-56. By contrast, one court has held that copyright of a program-generated screen display as an audiovisual work also protects the program to the extent that the program embodies the display. M. Kramer Mfg. Co. v. Andrews, 783 F.2d 421, 442 (4th Cir. 1986).

214. *Digital,* 659 F. Supp. at 456.

215. *Id.*

216. The plaintiff in *Digital* also claimed that the Mirror status screen violated plaintiff's separate copyright in the Crosstalk XVI status screen itself as an audiovisual work. *Id.* at 454. The *Whelan* opinion influenced the *Digital* court's determination of this issue as well. The court applied the *Whelan* rule for distinguishing idea from expression, and found that the screen contained both ideas and expression not necessary to those ideas. *Id.* at 458-59. The court asserted that ideas such as "the use of a screen to, reflect the status of the program . . . the use of a command driven program . . . and the typing of two symbols to activate a specific command" were not protectable by copyright. *Id.* at 459. However, it stated that expressive elements such as "the arrangement of the parameter/command terms" and "the highlighting and capitalizing of two specific letters of the parameter/command terms listed" were protectable. These expressive aspects of the screen involved "considerable stylistic creativity and authorship above and beyond the ideas embodied in the status screen," and represented only one of many ways of expressing the ideas involved. *Id.* at 460.

The court also used *Whelan* to support its finding that the status screen was not barred from copyright protection as a blank form because the screen itself conveyed information. *Id.* at 461. It cited *Whelan* as correctly stating the rule that blank forms or computer program file structures are within the scope of copyright

It seems clear that, as between *Broderbund* and *Digital*, the latter interprets *Whelan* correctly as to copyright protection for screen displays. The *Whelan* court did not say that screen displays themselves fell within the scope of protection afforded by program copyright. It merely allowed evidence of screen display similarity to support other evidence suggesting substantial program similarity, and expressed some reservations about going even that far.[217] Future decisions probably will interpret screen displays as outside the scope of copyright in the programs which generate them, leaving the displays to the potential protection of separate copyright as audiovisual works.

The fact that the *Broderbund* court tried to stretch *Whelan* so far may be a further indication that evidence of misconduct or blatantly unfair behavior by a party can strongly influence the outcome of software copyright infringement cases.

CONCLUSION

In future copyright infringement cases involving computer software, attorneys for both sides are likely to find that coming to grips with *Whelan* is essential to successful advocacy. Both the careful reasoning of the Third Circuit's opinion and the reaction of other courts in later cases suggest that the principles enunciated in *Whelan* will become permanent additions to the law in this area. While true predictability in matters of software copyright remains out of reach, the *Whelan* decision has further defined the scope of copyright protection for computer programs, and has provided an analytical framework for future decisions.

WM. DAVID TAYLOR III

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protection if their arrangement and organization itself conveys information. *Id.*

Presumably because it was comparing screen displays and felt no need for expert assistance, the *Digital* court did not employ the *Whelan* one-part, expert-based substantial similarity test, but used the traditional *Arnstein* test. *Id.* at 464-65.

217. *See supra* notes 138-41 and accompanying text.