Protecting Proprietary Rights of Computer Programs: The Need for New Legislative Protection

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The Need For New Legislative Protection

The computer\textsuperscript{1} industry,\textsuperscript{2} although still in its infancy, has had a tremendous impact upon the American economy.\textsuperscript{3} Each year the computer industry spends over a billion dollars in the production of computer programs.\textsuperscript{4} The industry has enjoyed rapid and prosperous expansion, and the problem of adequate legal protection for computer programs is of increasing importance.\textsuperscript{5} Traditionally, the means of protecting intellectual and industrial property are patents, copyrights, and trade secrets. There are several advantages and disadvantages with each type of protection. This article provides a general background analysis of the computer industry. It discusses the existing protection afforded to computer programs, and concludes with some suggestions for both temporary and permanent solutions to the problem. A general introduction to the computer industry is needed, however, so that the difficult problems in the discussion of the legal protection may be more fully comprehended.\textsuperscript{6}

1. This paper is designed for the layman who lacks a comprehensive understanding of the data processing field.

   The computer is a complex system of electronic circuitry which is specially designed to perform certain tasks. There are two basic types of computers: digital computers which contain information represented in a discrete form and calculates by using numbers to represent the variables in a program; and, analog computers which calculate by using physical analogs (usually electrical) of the variables. Throughout this note, the term "computer" refers only to the digital computer.

2. The computer industry is comprised of "hardware" and "software" manufacturers. Hardware may be viewed as simply the physical equipment. Software is the name given to that program which is designed to instruct the hardware to perform a particular application.

   Software firms are usually small and virtually unknown to one unfamiliar with the computer industry. Hardware companies, however, are well-known to the public at large, \textit{e.g.}, I.B.M., Burroughs, Sperry Rand, National Cash Register, Control Data Corporation, G.E., R.C.A., and Honeywell.

3. "Computers and automatic machines of various types are now a part of modern American life. If the banks did not use them, they could not keep up with the flood of checks; if the insurance companies did not use them they would have to charge much higher premiums; if the government did not use them, there would be no space programs . . . , our defense capability would be much weaker, and the government payroll would be much larger." ABA, \textit{Computers and the Law} (1966); \textit{See MacDonald, Over 700 Areas of Application of Computers, Computers and Automation}, June 1964, at 82.

4. The terms "programs," "computer programs," and "software" are used interchangeably throughout this note. The meaning of these terms, for purposes of this article, is the same. For definition see note 2 supra.

5. \textit{See text accompanying notes 13-19 infra.}

Programs, Programming Industry, and Protection

A. Programs

A computer program consists of a set of instructions which control the transfer of data within the computer. These instructions control the computer's performance of certain logical operations consisting of a computation of the raw data fed into the computer. Thus, in its simplest and most common meaning, a program is a number of instructions which can be thought of as a "process."

A computer program is composed by a "programmer." Through the program, the programmer instructs the computer. He breaks down a given problem by determining the exact sequence the data is to be operated upon by the computer and then writes out the program in computer language. The program is next punched onto cards or magnetic tape which is fed into the "input" unit of the computer and stored in the "memory" unit. A "control" unit then interprets the instructions, and directs the data to the "arithmetic" unit where the specific calculations are performed. The results of these operations are later directed to a new memory location. The final step is the "output" which consists of calculations available to the computer user and is usually written on printed paper or magnetic tape.

B. The Programming Industry

Although the computer industry is relatively new, it is one of the fastest...
developing businesses in the American economy.\textsuperscript{13} The growth of the industry has occurred in this generation. The first electronic digital computer was developed in 1946;\textsuperscript{14} in 1952 there were less than two dozen computers;\textsuperscript{15} in 1964 there were 16,000 computers;\textsuperscript{16} in 1968 there were 40,000 computers;\textsuperscript{17} and, estimates for future growth predict 85,000 computers by 1975.\textsuperscript{18} In terms of the monetary value of computers (with programs included) in the United States one commentator has estimated that in 1965 there was $7.7 billion dollars worth of computer equipment, in 1968 the value was $13.7 billion, and by 1972 the value will be $30 billion.\textsuperscript{19}

The programming industry has progressed at an even more rapid pace than the computer manufacturing industry. Since software costs exceed that of hardware, the role of software is not likely to diminish.\textsuperscript{20} Despite the progress in the computer software industry, there is a significant problem with a shortage in the supply and quality of computer programs. Essentially there are four reasons for this shortage. The first two are the lack of qualified programmers\textsuperscript{21} and the limited useful life of programs.\textsuperscript{22} These reasons, however, are reduced to secondary importance when compared to the third and fourth factors unauthorized copying of programs by rival companies, and secrecy. Without adequate legal protection, software developers have often refrained from developing new programs because they cannot be assured that rival users can be forced to pay a proportionate share of the development expense.\textsuperscript{23} In the


\textsuperscript{14} J. Bernstein, \textit{The Analytical Engine}, 54 (1966).

\textsuperscript{15} See Burck, note 13 at 107, supra.

\textsuperscript{16} \textit{Id.}.

\textsuperscript{17} \textit{Datamation}, Sept. 1968, at 87.


\textsuperscript{20} The following estimates illustrate the striking growth of the programming industry: during the 1950's only five percent of all computer industry funds went to software; in 1965, $3.2 billion was spent on software as compared to $2.8 billion on hardware; and, by 1972, the value of the software market may be $11 billion. See Producer Takes a Hard Look at Software, \textit{Electronic News}, Nov. 7, 1966, § 2, at 6; Elliott, \textit{Thinking Big}, \textit{Barrons}, Oct. 2, 1967, at 3; Burck, supra note 19, at 145.

\textsuperscript{21} "Shortage of programmers—and the fruits of their solitary art—is stunting growth of the computer's use and costing industry hard cash. . . . The overriding issue is people—specifically, skilled computer personnel. . . . Already the supply is far shorter than the demand and the gap is widening inexorably. For the foreseeable future, there is literally no possibility that we shall have enough trained people to go around." \textit{Software Gap—A Growing Crisis for Computers}, \textit{Bus. Week}, Nov. 5, 1966, at 12; See also Campise, \textit{The Software Dilemma}, \textit{Data Management}, Nov. 1967, at 16.

\textsuperscript{22} \textit{Software gets a Hardshell Approach}, \textit{Bus. Week}, Oct. 21, 1967, at 176. The useful life of a basic program depends upon its application but the average is approximately three years. Interview with Mr. Daniel Snyder, Administrative Analyst Data Processing Div., I.B.M. Corp. in Washington, D.C., July 21, 1971.

\textsuperscript{23} See Banzhaf, \textit{Legal Protection for Computer Programs}, \textit{Data Processing}, July 1964, at 8;
absence of legal protection which would effectively eliminate, or significantly reduce unauthorized program copying, those programs that have been developed have either been donated for general use through sharing organizations or have been kept secret. Neither approach is satisfactory.

C. The Need for Protection

The basic reason for protecting computer software is to promote the advancement of this technology by giving an incentive to programmers (and their employers) to release new programs. Progress in this field can thus be seen as providing a guarantee to the programmers that the result of their creative efforts can be traded in the open market. In this respect, the program is similar to any other valuable commodity in a free enterprise system.

Growth in the computer industry can be achieved only through improvements and, consequently an effective means of protecting these improvements is needed. There are two main factors, based upon public policy considerations, which accentuate the need for program protection. First, the shortage of programmers is critical. Protection could prevent duplication of effort by eliminating communication barriers among potential buyers and sellers and

24. Id.
25. "Programming has given birth to a new group of companies in the past five years. . . . The field is burgeoning; new companies are being formed every day." Software Gap—A Growing Crisis for Computers, BUS. WEEK, Nov. 5, 1966, at 134.
26. "[T]here is no question that legal protection is needed for that creative effort of the software manufacturer, and with meaningful legal protection a revolutionary aspect would take place in the competition of data processing industry." Copyright and Patent Reform Bills, Hearings on S.597 Before the Subcomm. on Patents, Trademarks, and Copyrights of the Senate Comm. on the Judiciary, 90th Cong., 1st Sess., pt. 3, at 766 (1967) (Statement of M. Jacobs, Esq.).
[A] major issue is to ensure appropriate incentives to secure a creative thrust of these commercial information entrepreneurs in the utilization of the new technologies addressed by this inquiry. Their success in creating and packaging information products in appropriate forms for electronic communication depends in large measure on the availability of a system of proprietary rights suited to these technologies.
28. "[T]he prospects of recovering leasing fees, and the likelihood of recovering the high costs of software development would act as incentives for new developments." Keller & Moshman, supra note 27.
30. See note supra.
31. "Any legal mechanism which enhances the public knowledge of the existence of particular programs would be beneficial insofar as it would prevent the necessity for programmers duplicating work which has already been accomplished—what is often called 'reinventing the wheel.'" Koller, Computer Software Protection, 13 IDEA 357 (1969). See also Irwin, The Computer Utility: Competition of Regulation?, 76 YALE L.J. 1299 (1967).
also serve as an encouragement for potential software houses to enter the field. Secondly, innovations are needed so that the industry will continue to progress. A strong and effective competition supplies the force behind innovation. Thus, with protection, there is a great likelihood that the quality of software will be increased.

The fever towards protection has been heightened by the trend within the software industry towards increasingly complex, more expensive, and longer lifespan programs. Indeed, an earlier policy of free interchange of programs has, for all practical purposes, passed. Other arguments in support of protection emphasize, first, that the only viable alternative is secrecy, which may result in stagnation, second, that protection is important for professional recognition and pride of authorship, and, last, that it would help reduce industrial espionage.

Although there are many competing interests in the computer field each favoring different forms of protection, all concede that some type of protection should be given to computer programs. This consensus favoring protection is a recent development. Most software houses have always been in favor of protection, but previously, the hardware manufacturing companies were opposed to any form of protection. However, since I.B.M. Corporation's "unbundling," i.e., separate marketing of hardware and software, in January 1970, most manufacturers have supported protection.

32. Edmund C. Berkeley, editor of "Computers and Automation" estimates that in 1985 there will be in the United States: Ten hardware manufacturers; 5,000 computer service organizations; 1,000 consulting firms; and 1,000 software suppliers. Looking Twenty Years Ahead: The Computer Directory and Buyers' Guide, COMPUTERS AND AUTOMATION, June 1965, at 9.

33. "A computer program is the intellectual heart of a computer operation. The full monetary value of a program cannot always be measured because it is determined by both tangible and intangible factors. . . . The cost of developing a program is more likely to run into six than five figures." Katana, Legal Protection of Computer Programs, 47 J. PAT. OFF. SOC'Y 955-56 (1965).

34. See Elliott, Thinking Big, BARRONS, Sept. 18, 1967, at 3.

35. Software companies have stated that the lack of protection eliminates the possibility of competitive software development and marketing causing inseparable harm to the software companies, and consequently discourages manufacturers from producing the most effective software. See generally Jones, A Time to Assume Responsibility, DATAMATION, Sept. 1967, at 160; Wessler, Editorial in ELECTRONIC NEWS, May 8, 1967, at 36; Goetz, Today's Commercial Software, DATAMATION, May 1966, at 117, 118.


38. Interested parties are the computer manufacturers, sales organizations, leasing firms, and commercial, industrial, scientific, and research users. See, e.g., Reynolds, Software Protection and Software Sale, DATA PROCESSING, May 1967, at 50; Sundeen, General Purpose Software, DATAMATION, Jan. 1968, at 22.
Types of Legal Protection

A. Patents

Generally

Patent protection is provided by Congress to "whoever invents or discovers any new or useful process, machine, manufacture, or composition of matter . . . ," which fulfills the statutory requirements of novelty, utility, or nonobviousness. In exchange for a complete disclosure of his invention, the inventor receives the right to exclude others from making, using, or selling the invention for a period of 17 years.

The United States Patent Office has not favored making computer programs patentable. This reluctance was reinforced by a Presidential commission established to examine the patent system and by the Patent Reform Bill. However, these attempts to exclude programs from patentable subject matter subsided as political pressure from the industry and the patent bar in favor of patent protection mounted. Theoretically speaking, there appears to be no satisfactory basis for distinguishing a computer program from other devices which are patentable. Today, computer software may fall within two statutory classifications of patentable subject matter—"process" (method), or "apparatus" (machine or manufacture).


41. Id.

42. The Patent Office, in its Guidelines of 1966 and 1968 favored a very restrictive approach towards the patentability of computer programs: "The basic principle set forth in the foregoing guidelines in that computer programming per se, whether defined in the form of process or apparatus, shall not be patentable." 855 OFF'L GAZETTE OF THE U.S. PAT. OFF. 830 (1968) [hereinafter cited as GUIDELINES].

43. PRESIDENT'S COMM'N ON THE PATENT SYSTEM, REPORT 2-3, at 12 (1966): "The Commission believes strongly that all inventions should meet the statutory provisions for novelty, utility and unobviousness and that the above subject matters [which includes programs] cannot readily be examined for adherence to these criteria."

44. H.R. 5924, 90th Cong., 1st Sess. § 106 (1967): "A plan of action on a set of operating instructions, in whatever form presented, to cause a controllable data processor or computer to perform selected operations shall not be patentable."


46. For example, in 1843 the Supreme Court held that the patent laws extended to cover metallurgical processes (McClurg v. Kingsland, 42 U.S. 202); in 1853 to chemical processes (Corning v. Burden, 56 U.S. 252); in 1877 to food processing (Cochrane v. Deener, 94 U.S. 780); in 1887 to mechanical processes (Eames v. Andrews, 122 U.S. 40); and in 1888 to electrical processes (The Telephone Cases, 126 U.S. 1).
Process is defined as a "process, art, or method, and includes a new use of a known... machine...". Process claims are generally divided into two categories: patentable processes, and mental processes.

A process patent was defined in the landmark case of Cochrane v. Deener as "an act, or a series of acts, performed upon the subject matter to be transformed and reduced to a different state or thing." The Cochrane case is often cited by the Patent Office to rationalize the exclusion of computer programs from patentable subject matter because no transformation of a tangible substance has occurred. The Telephone Cases, however, illustrate the principle that the manipulation of an electric current can constitute such a transformation. One commentator suggests that if a computer program is submitted as a novel or unobvious method of manipulating electrical input signals (representing data) and transforming the signals in a prespecified manner to produce useful output signals (results), the program should constitute a patentable process.

Mental Processes

The Patent Office has never considered ideas, expressed as purely mental processes, to be patentable subject matter. If the computer program is viewed as a series of thought processes then it merely consists of mental steps which are nonstatutory, i.e., outside the language and spirit of the Patent Act. The reasoning behind this limitation is based upon public policy considerations which forbid a monopoly on ideas. Perhaps the main difficulty in the area of mental processes stems from a confusion in terminology.

Although some computer programs may be considered within the Patent

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47. 35 U.S.C. § 100 (1964). A new use for an old machine is the most elementary form of a process patent. It must, however not be analogous to prior applications. This protection is so extremely limited that it is practically useless. Puckett, Protection for Computer Programs, in 16 ASCAP COPYRIGHT LAW SYMPOSIUM 108 (1968).

48. 94 U.S. 780 (1877).

49. Id. at 788.

50. See GUIDELINES 829.


52. Puckett, supra note 47, at 110.

53. For the case development of the mental-step doctrine see Halliburton Oil Well Cementing Co. v. Walker, 146 F.2d 817 (9th Cir. 1944); In re Abrams, 188 F.2d 165 (C.C.P.A. 1951); In re Shao Wen Yuan, 188 F.2d 377 (C.C.P.A. 1951); Ex parte Monroe, 105 U.S.P.Q. 376 (Bd. App. 1955); Ex parte Egan, 129 U.S.P.Q. 23 (Bd. App. 1960).

54. See Nimtz, supra note 8, at 216: "Again we find the term 'program' used to obfuscate rather than elucidate the basic question involved. The real question is, should we consider the machine operations necessary to process data as mental steps?"

55. Other nonstatutory subject matter include: (1) Mathematical, mental, or logical formulae, methods, or steps; (2) discoveries of physical phenomena or natural laws; (3) printed matter; and (4) ways or methods of doing business. Graham, supra note 39, at 482-83.
statutes if they concern tangible things and substances, the Patent Office originally adopted the narrow position that nearly all programs represent processes which are simply expressions of a nonstatutory algorithm. But the Court of Customs and Patent Appeals in In re Prater and Wei reversed the ruling of the Patent Office when it held that computer programs could be patentable even though the process could be performed by mental steps. Later cases extended this policy.

For a program to be patentable as an apparatus it must be either a new machine, a new process, or a new combination of both. One theory on patentability proposes that a computer machine and a computer program taken together, is patentable as an apparatus because it is a single device, or machine. According to this view, when the computer receives the program, the program becomes physically a part of that machine. In utilizing such an approach, the claimant could seek a patent for the combination which the union of the program with a computer creates; or as an alternative, claim the program itself as a machine. Nevertheless, the Patent Office's requirement of novelty has reduced the possibility of a patent for the computer program considered as an apparatus to near impossibility.

56. Guidelines to Examinations of Programs, 829 OFF'L GAZETTE OF THE U.S. PAT. OFF. 1-3 (1966). An algorithm has been defined as a finite set of rules which gives a sequence of operations for solving a specific type of problem.

57. 415 F.2d 1393, 162 U.S.P.Q. 541 (C.C.P.A. 1969). This case held that:
No reason is now apparent to us why, based on the Constitution, statute or case law, apparatus and process claims broad enough to encompass the operation of a programmed general purpose digital computer are necessarily unpattentable . . . subject, of course, to the requirements of novelty, utility and nonobviousness. Based upon the present law, we see no other reasonable conclusion.

Id. at 1403 n.29.


Also, the rule under the GUIDELINES is that a machine which has as part thereof a program device to cause the entire combination to carry out machine functions is embraced within the patent statute the same as any other special purpose machine and the fact that portions of the complete machine take the form of a replaceable program device is of no moment. 855 GUIDELINES 830.


62. One authority suggests that "obviousness" should be one of the tests of computers programs. Hamlin, Computer Programs are Patentable, 7 COMMUNICATIONS OF THE ACM 581 (1964).

63. "A patent may not be obtained . . . if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which
Advantages of Patent Protection

The advantages of patent protection for computer software originate from the statutory shield afforded to all patent owners. Patent protection grants a 17-year monopoly from the date of issuance while allowing the invention to remain secret and protected until the Patent Office issues the patent. Once the patent is issued all intended users must make agreements with the patent holder. Other arguments favoring patent protection stem primarily from public policy considerations which encourage inventions and early disclosures, and stimulate competition.

Disadvantages of Patent Protection

Opposition to protection of computers under patent laws generally rest upon the President's Commission on Patents which suggested that the law be amended to ensure that computer programs would not be patentable. The reasons given for its recommendation can be summarized as follows: (1) it is uncertain whether the statute permits a valid patent to be granted on computer programs; (2) prior art cannot be searched because of the lack of classification technique and search files, and the large volume of prior art; (3) program development has been adequate without patent protection; and (4) copyright protection for programs is presently available.

Aside from these difficulties, there are inherent weaknesses in patent protection. First is the high expense of obtaining a patent. An average expenditure of approximately $1,000 for obtaining a patent has been estimated by several authorities. Secondly, the time factor is a drawback since the ordinary time lapse between the submission of an invention to the Patent Office and the issuance of the patent is slightly more than three years—which normally is the useful life of most programs. A third difficulty involves the high standards of qualifying for patent protection. It has been predicted that


65. PRESIDENT'S COMM'N supra note 43 at 12-13. For a detailed discussion of counterarguments to the Commission, see Nimtz, supra note 8, at 207-13.

66. This figure includes a "$30 statutory filing fee" (35 U.S.C. § 41 (1964)) and legal and drafting fees.


68. See note 22 supra.

also be unable to meet the strict patent standards.\textsuperscript{70} Also, the uncertainty of the specific protection afforded under a patent and the extreme difficulty of detecting infringement\textsuperscript{71} present serious questions on the desirability of patenting computer programs.

Another significant problem area in patent protection involves the administrative difficulties within the Patent Office itself. The Patent Office needs more examiners skilled in the technical arts.\textsuperscript{72} In the past it has been difficult to engage and retain qualified examiners;\textsuperscript{73} a phenomena most often attributed to the higher salaries offered outside of the governmental agency.\textsuperscript{74} Additionally, there is the critical emergency of a backlog in applications for patents.\textsuperscript{75} This continuing problem\textsuperscript{76} has reached such dimensions that the future of the Patent Office is in serious jeopardy due to its inability to handle patent applications.\textsuperscript{77}

A final difficulty with patent law is the potentially detrimental effect of patent protection on the programming industry. It has been argued that the broad protection afforded under patents will encourage an oligopoly within the computer industry and raise new entry barriers to the currently "open field" of software production.\textsuperscript{78} In such a competitive situation, the manufacturing companies would be in an advantageous position due to their larger research

\textsuperscript{70} "The history of the American patent system is replete with the continuing tension between a strong public policy against monopoly and a desire to encourage inventions which will benefit the public. This tension has been resolved by the courts setting a high and exacting standard for patent validity." Ashcroft v. Paper Mfg. Co., 434 F.2d 910, 168 U.S.P.Q. 66, 68 (9th Cir. 1970).

\textsuperscript{71} Bender, \textit{Trade Secret Protection of Software}, 38 GEO. WASH. L. REV. 915 (1970) [hereinafter cited as Bender].

\textsuperscript{72} At the end of fiscal year 1970, there were 1,706 examiners in the Office of Patent Examining. \textit{PATENT OFFICE, U.S. DEP'T OF COMMERCE, COMMISSIONER OF PATENTS ANNUAL REPORT FISCAL YEAR 1970}, at 29.

\textsuperscript{73} Interview with Mr. Herbert Wamsley, an examiner in the Patent Office, in Washington, D.C., July 12, 1971.


\textsuperscript{75} One observer has noted that: "The examination of applications for patents in the United States Patent Office is falling so far behind that, unless improvement is effected, the patent system itself will have to be changed, at least to the extent that examination will be curtailed or dispensed with." 47 J. PAT. OFF. SOC'Y 148 (1965). \textit{See also} Railton, \textit{The Examination System and the Backlog Problem}, 9 IDEA 487 (1965).

\textsuperscript{76} The backlog has long been criticized. As far back as December 21, 1848, the House of Representatives ordered the Committee on Patents to investigate the delay in examining patent applications. \textit{CONWAY, EXPEDITION PATENT OFFICE PROCEDURE—A LEGISLATIVE HISTORY}, in STAFF OF THE SUBCOMM. ON PATENTS, TRADEMARKS, AND COPYRIGHTS OF THE SENATE COMM. ON THE JUDICIARY, 88TH CONG., 2ND SESS. STUDY NO. 23, at 4.

\textsuperscript{77} \textit{See} S. REP. NO. 118, 88th Cong., 2d Sess. 8 (1965): "In the absence of significant administrative or statutory changes, the Patent Office projects a 1975 backlog of 535,000 applications."

\textsuperscript{78} \textit{See Proposed Revisions, supra note 69, at 1554.}
and legal capabilities.\textsuperscript{79} Research and development within the industry would be stifled.\textsuperscript{80}

B. Copyrights

Generally

A copyright is a legal monopoly given only to authors.\textsuperscript{81} The constitutional purpose of a copyright is "[t]o promote the Progress of Science and Useful Arts, by securing for limited times to Authors . . . the Exclusive Right to their . . . Writings."\textsuperscript{82} In order to receive a copyright,\textsuperscript{83} it is necessary that the "writings of an author" be published with the required copyright notice and deposited for registration.\textsuperscript{84} Protection under the copyright law grants the author the exclusive right to copy, publish, and sell his writings for 28 years.\textsuperscript{85}

In 1964 the Copyright Office decided that computer programs can be registered as copyrights\textsuperscript{84} provided certain requirements are met.\textsuperscript{87} Although the Copyright Office has made this announcement, there are important questions still unsettled as to whether programs are the "writings of an author" within the present law.\textsuperscript{88} Nevertheless, the computer program, by its very nature, appears to be clearly within the statutory requirements of registrability. The general consensus among members of the bar and legal commentators is that programs are writings in the constitutional and statutory senses.\textsuperscript{89} Furthermore,

\textsuperscript{79} Id.
\textsuperscript{80} Id.
\textsuperscript{81} See generally Note, Copyright Protection For Computer Programs, 64 COLUM. L. REV. 1274 (1964); Comment, Scope of Protection For Computer Programs Under the Copyright Act, 14 DEPAUL L. REV. 360 (1964); Note, Computers, the Copyright Law and Its Revision, 20 U. FLA. L. REV. 386 (1968); Cary, Copyright Registration and Computer Programs, 11 BULL. COPYRIGHT SOC'Y 361 (1964).
\textsuperscript{82} U.S. CONST. art. I, § 8.
\textsuperscript{86} U.S. Copyright Office, Announcement SML—47 (May 19, 1964).
\textsuperscript{87} Three conditions which software must meet are: (1) original authorship; (2) publication of copies in a form perceptible or capable of being perceptible to the human eye; (3) depositing copies for registration to consist of or include reproductions in a language intelligible to human beings.
\textsuperscript{88} Other questions include: Are patent and copyright protection mutually exclusive? Does software qualify as a writing? What is the scope of copyright protection of software? Should restriction go solely to copying or should the use of a computer also be restrained? How easy will it be to "program around" a copyright? Is a magnetic tape a "copy"? Bender 916-17.
\textsuperscript{89} Goldberg 9; See also Copyright Office Circular No. 31D (April, 1967) which states: "The preparation of programs involves substantial elements of gathering, choosing, rejecting, editing and arranging materials. Some programs also embody verbal material which is written by the programmer and can be considered literary expression."
neither the courts nor Congress has yet contravened the decision of the Copyright Office; and the Copyright Reversion Bill seems to include software as registrable.\textsuperscript{90}

Another form of copyright protection is the common law which is, by definition, independent of any congressional legislation.\textsuperscript{91} Common-law copyright is obtained merely by the creation of the work must remain unpublished.\textsuperscript{92} As contrasted to statutory copyright, the work under common-law copyright need not be a writing but may be any literary expression developed beyond an abstract idea.\textsuperscript{93}

\textit{Advantages of Copyright Protection}

Statutory copyright is easily and inexpensively obtained, and available immediately.\textsuperscript{94} The dissemination to the public of the disclosed technology is certainly increased through copyrighting.\textsuperscript{95} Once an infringement has been detected, the copyright owner may receive the benefits of the statute (e.g., statutory recovery damages) even though there has been no proof of actual damages. In addition, the period of copyright protection is quite long. Under current statutory law a 28 year term is provided for, and is renewable for an additional 28 years.\textsuperscript{96}

Common-law copyright costs nothing to obtain and lasts indefinitely so long as the work remains unpublished. Under this form of protection the policing and administration are relatively simple to control because of the inherently limited disclosure and dissemination.\textsuperscript{97} Finally, providing there is no publication or undisclosed dissemination of the work, there is no serious question as to the validity of this type of protection.\textsuperscript{98}

\textsuperscript{90} S. 543, 91st Cong., 1st Sess. § 102 (1969), wherein copyrightable subject matter is defined as "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."

\textsuperscript{91} There are some interesting cases in common-law copyright; see e.g., Edgar H. Wood Associates v. Skene, 141 U.S.P.Q. 454 (Sup. Jud. Ct. Mass. 1964).

\textsuperscript{92} M. Nimmer, Copyright § 11.1, at 39 (1967).

\textsuperscript{93} Id.

\textsuperscript{94} See Copyright Office, Circ. No. 35, General Information on Copyright (1965).


\textsuperscript{96} The utility of a computer program is, of course, not likely to be nearly so lengthy; thus, any discussion of the duration of copyright protection is academic.

\textsuperscript{97} Goldberg, supra note 45 at 15.

\textsuperscript{98} Id.
Disadvantages of Copyright Protection

Since the Copyright Office's announcement in 1964 that it would accept computer programs as copyrightable subject matter, approximately 200 programs have been registered. The small number of registered programs is attributable to the undesirability of this form of protection. Most significantly, a copyright provides a right which protects only the form of expression of a work, not its substance. It does not protect the ideas contained in the work which is the protection sought by most software originators. Nor does it necessarily ensure a complete and useful disclosure of a new technology.

The main disadvantage of the common-law copyright is the great care which must be exercised to prevent publication or public dissemination. If the work is considered "published" and the statutory requirements of publication are not met, it is in the public domain and without any protection. A second

100. "Copyright protection is essentially meaningless for practical purposes in dealing with the development of this [computer] technology, just as it is meaningless for any other machine technology." Statement of M. Jacobs, supra note 26, at 769. See also Note, The Uneasy Case for Copyright: A Study of Copyright in Books, Photocopies and Computer Programs, 84 Harv. L. Rev. 344 n. 247 (1970): "Of course this number [200] may reflect several other factors. For one thing, programs can be copyrighted without being registered . . . . For another, the law on copyrighting programs has not yet been clarified through court proceedings. Further, programmers may fear that copyright protection will prove ineffective. . . ."

101. For example, the Supreme Court has stated:

The copyright of a work on mathematical science cannot give to the author an exclusive right to the methods of operation which he propounds, or to the diagrams which he employs to explain them, so as to prevent an engineer from using them whenever occasion requires. The very object of publishing a book on science or the useful arts is to communicate to the world the useful knowledge it contains.


104. Infringement is a very difficult area in copyright. See such statements as: "Unauthorized use of a program to control a computer, however, would appear not to be an infringement of the copyright." Banzhaf Protection for Computer Programs, 14 ASCAP COPYRIGHT LAW SYMPOSIUM 136 (1966); "The problem of detecting infringement is considerably more difficult in the case of copyrighted programs than in that of most copyrighted works." Note, Colum. L. Rev., supra note 95 at 1293; "If you had a copyrighted program, which somebody finds it necessary to use, such use is not an infringement." Hearings on H.R. 2512 Before the Subcomm. on Gov't Activities of the House Comm. on Gov't Operations, 90th Cong., 1st Sess. 170, (1967) (Statement of Cary, Deputy Register of Copyrights).

105. Goldberg 15.
drawback concerns infringement and the difficult burden the plaintiff has in proving actual damages sustained in order to obtain monetary recovery. A final problem is that this type of protection is based on state law and consequently any damages provided by the federal copyright law are not available in case of infringement.

C. Trade Secrets

Generally

Trade secret law is currently the most widely used method of legal protection for computer programs. The right to protection under trade secret law was originally granted by the laws of unfair competition, but elements from the other areas of law are now included within its scope of protection. Trade secrets is difficult to define with any degree of certainty because state, not federal law, governs this area and the law varies from state to state. Trade secrets encompass every kind of information that a firm considers confidential; generally in the software industry this includes the subject matter of a computer program, i.e., cost, data, price information, customer lists, anthologies, and technical information.

In contrast to the statutory protection of patents and copyrights, there are no expressed trade secret statutes. Legal protection can, however, be found in the common law, equity, criminal law, and state larceny statutes.

\[\text{References}\]

106. \textit{Id.} See also Nimmer, supra note 92, at 40.
107. Goldbert, supra note 45 at 16.
108. For an excellent discussion, see Bender. See generally Harris \& Siegel, \textit{Protection of Trade Secrets: Initial Report}, 8 IDEA 360 (1964); Harris \& Siegel \textit{Trade Secrets in the Context of Positive Competition}, 10 IDEA 297 (1966).
112. \textit{Restatement of Torts}, Explanatory Notes § 757, comment b at 5 (1939) defines trade secrets as: "[a]ny formula, pattern, device or compilation of information which is used in one's business, and which gives him an opportunity to obtain an advantage over competitors who do not know or use it. It may be a formula for a chemical compound, a process of manufacturing, treating or preserving materials, a pattern for a machine or other device, or a list of customers."
114. Note, however, that there are federal statutes regulating the transportation (18 U.S.C. § 2314 (1964)), sale and receipt (18 U.S.C. § 2315 (1964)), of stolen goods, merchandise, securities or money.
115. See generally Ellis.
116. For example, in Schulenburg v. Signatrol, Inc., 50 Ill. App. 2d 402, 411-12, 200 N.E.2d 615, 620 (1964) the court held that even though an injunction may be a drastic remedy, it is valid in order to "give to plaintiffs their just due." See also McClain \textit{Injunctive Relief Against Employees Using Confidential Information}, 23 KY. L.J. 248 (1935).
The essential requirement in gaining protection is that the program must be kept secret. Although secrecy need not be absolute, it must be shown that the secret is "novel" and is not known within the industry. Disclosures are permissible, but must be limited to persons in confidential relationships with the owner according to an agreed "obligation of trust and confidence." In the programming industry there are two primary contractual methods of establishing a legal duty not to disclose a secret. One method is to procure restrictive employment contracts whereby employees promise not to divulge trade secrets. Another method is to obtain contracts with program lessees whereby they promise not to divulge the secret.

The fraudulent appropriation of another's secret, such as by theft, bribery, or a breach of a contract requiring the program to be kept confidential, will allow the owner to seek the protection of the court to enforce his rights and to remedy the invasion. A breach of a confidential relationship is the most common violation; such a breach need not necessarily be expressed but may

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118. Whether the taking of a trade secret constitutes larceny is dependent upon the precise wording of the state statute. For further discussion see Bender at 944.
120. A trade secret has been defined by the courts as anything hidden from general knowledge or observation. Kaumagraph Co. v. Stampagraph Co., 235 N.Y. 1, (1923); Also, Professor Bender believes that "the most confusing aspect of trade secrets emanates from semantic difficulties." He claims that "'secrecy' and 'novelty' are in one respect interchangeable and 'novelty' is often confused with the concept of invention." Bender 928.
121. See McPherson, Williams & Wilson, Loss of Trade Secrets Through Changes in Employment, 8 IDEA 36-40 (1964). A trade secret violation has been described as the "breach of confidence and fact that at some later time he violated his agreement and trust he could have obtained information elsewhere does not excuse his conduct Protection is given against the reprehensible means, such as a breach of confidence, employed in gaining the secret." General Aniline and Film Corp. v. Frantz, 151 U.S.P.Q. 136 (1966). See also E.I. DuPont de Nemours Powers Co. v. Masland, 244 U.S. 100, 102 (1917) (Holmes, J.) "Whether the plaintiffs have any valuable secret or not the defendant knows the facts . . . though a special confidence that he accepted. The property may be denied but the confidence cannot be. Therefore the starting point for the present matter is not the property . . . but that the defendant stood in confidential relations with the plaintiffs . . . ."
122. See Note, supra note 64, at 590.
123. Nims § 149.
124. Id. § 143.
125. The four remedies for invasions of a developer's property are: (1) Injunction against disclosure of secret; (2) Injunction against use of secret; (3) Damages for injury resulting from disclosure; and (4) Award of damages or accounting for profits derived from use of secret. Ellis 26-27.
126. See Blake, Employee Agreements Not to Compete 73 HARV. L. REV. 629-91 (1960); McClain, Injunctive Relief Against Employees Using Confidential Information, 23 Ky. L.J. 248 (1935).
be implied from the conduct of the parties. Nevertheless, nondisclosure provisions in employment contracts are suggested in order to avoid confusing interpretations of a confidential relationship. Even though courts will usually decide these cases on the basis of trust, unreasonable provisions in the contract will not be upheld. Similar contractual agreements are also sought to apply after the employee separates from his employer. These agreements must be much more explicit than regular employment contracts because the employer's future livelihood is involved.

Under trade secret law, an owner of a program has the right to prevent the unfair taking of his secret. Exactly what is considered to be fair or unfair depends upon the facts and circumstances of each case, but generally any independently wrongful taking constitutes an unfair appropriation. Recovery is not limited to the contracting parties but may also be sought against those persons receiving a secret from another whom they know is or was in a confidential relationship. The courts in these cases attempt to balance major conflicting but socially desirable interests. On the one hand the community has an interest in maintaining high standards of business behavior, while on the other it attempts to avoid excessive restraints on employees. Although there is a strong public policy interest not to impede the mobility of labor, a degree of protection is needed in order to encourage investment and incentive.

128. Carpenter, Validity of Contracts Not to Compete, 76 U. Pa. L. Rev. 254, (1928) states:
   If the restraint is no more than is reasonably necessary to protect the employer against the deflection of customers or misuse of trade secrets by the employee through the opportunity which his employment has given him, the courts uniformly uphold the covenant and give relief either at law or in equity. But the promise by the employee not to compete will be bad if the restraint is more extensive territorily than is reasonably necessary to protect the employer's business . . . or if the restraint is for a length of time not needed to protect the employer's business . . . [or] where the purpose is to prevent the employee from quitting the employer's service and not to prevent use of detrimental information gained through employment.
130. Wessel, supra note 107, at 99-102.
132. Goldberg 16.
134. Milgrim, Trade Secrets, 1968 Proceedings B-33: "Essentially, the courts are called upon to discern whether the protection sought by the employer is reasonable when compared with the restrictions that it might place upon the employee's ability to earn a livelihood or the disservice that might be done to the public by a restriction of competition."
Advantages of Trade Secret Protection

Trade secret law is well-adopted and convenient for computer programs, and as a result, there has been a continuing reliance by the industry upon this method of protection. Express contractual protection is recommended because it allows for the defining of confidential status and grants broad protection against unauthorized disclosures. Software disclosures, if strictly controlled, can provide for adequate policing. In addition, despite the possibility of identical effort, it has been argued that some duplication is normal in a competitive situation and will result in higher quality products at lower prices. Due to the competitive advantage resulting from better products under trade secret protection, computer program developers have the incentive to produce better programs because sales will guard against infringement.

Disadvantages of Trade Secret Protection

Although it is unquestioned that trade secret protection covers computer programs it has many disadvantages. One weakness is that the developers do not have any idea whether their programs have been disclosed. A second problem is the disfavor shown by the judiciary on limiting the movement of employees and the use of their knowledge and skills in later employment. Public policy does not favor this restriction for an unlimited duration, and often employee contracts are held more restrictive than what is reasonably necessary for the protection of the employer. But, the main difficulty with trade secrets is that it requires concealment to be successful. This has the disadvantage of encouraging duplication. In addition, trade secret protection under contract must include every point on which the parties agree because any exclusion is considered intentional. Possible adverse effects of these restrictive contracts on the employer-employee relationship should also be weighed.

A final complication in trade secret law is the legal clouds cast by the Supreme Court in the 1964 cases of Sears, Roebuck & Co. v. Stiffel & Co.
and *Compco Corp. v. Day-Brite Lighting, Inc.*\(^\text{144}\) and in the 1969 case of *Lear, Inc. v. Adkins.*\(^\text{145}\) In the sweeping language of the *Sears* and *Compco* cases, the Court by implication, questioned the validity of trade secrets and held that federal patent law preempted state unfair competition laws.\(^\text{146}\) The Court, in the *Lear* case, was confronted with a trade secret license which afforded royalty payments to the developer. It refused to decide the issue on the grounds that the California Supreme Court had not discussed the problem below. In the dissenting opinion Justice Black, joined by Chief Justice Warren and Justice Douglas, argued that the right to a licensing agreement before a patent is issued should be invalidated; he concluded:

> One who makes a discovery may, of course, keep it secret if he wishes, but private arrangements under which self-styled 'inventors' do not keep their discoveries secret, but rather disclose them, in return for contractual payments, run counter to the plan of our patent laws, which tightly regulate the kind of inventions that may be protected and the manner in which they may be protected. The national policy expressed in the patent laws, favoring free competition and narrowly limiting monopoly, cannot be frustrated by private agreements among individuals, with or without the approval of the State.\(^\text{147}\)

Due to the Supreme Court's failure to resolve this issue, the future course of state trade secret law is most uncertain.

**Conclusion**

There is a deep and widespread interest in software as a result of its striking increase in commercial value and use over the past few years. The protection afforded the industry and the public under patents, copyrights, and trade secrets has certain advantages;\(^\text{148}\) however, the disadvantages decisively outweigh these

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\(^\text{144}\) 376 U.S. 234 (1964).


\(^\text{147}\) 395 U.S. at 677. For excellent commentaries favoring: (a) patent protection, see Comment, *Computer Program Protection: The Need to Legislate A Solution*, 54 Cornell L. Rev. 604 (1968-69); (b) copyright protection, see Note, *Copyright Protection For Computer Programs*, 64 Colum. L. Rev. 1275 (1964); (c) trade secret protection, see *Proposed Revisions*, 81 Harv. L. Rev. at 1557-57.

\(^\text{148}\) A final solution to this area would be expedited by Supreme Court review of a decision by the Court of Customs and Patent Appeals. However, such action would not facilitate the needed
advantages. In view of the severe weaknesses, protection for most software under present conditions is impractical, if not impossible. Consequently, a satisfactory solution to the software protection problem is not to be found within the framework of the present system.\textsuperscript{148}

There is no simple answer for the difficulties besetting computer program protection. However, the need for adequate protection is urgent and demands some solution.\textsuperscript{150} One immediate but temporary measure can be achieved through a modification of the present patent laws.\textsuperscript{151} An amendment could provide for short-term patents for the less significant software inventions.\textsuperscript{152} Such patents would be granted only upon a showing of a certain minimum level of originality, ingenuity, and utility—a minimum, however, which would be considerably below the standards applied under the present patent laws. Rarely is the useful life of a computer program longer than five years. Hence, a patent designed specifically for five years is most suitable for the industry.\textsuperscript{153}

The preferred permanent solution would be new, well-defined special

\textsuperscript{148} There is ample precedent in our law for treating a peculiar subject matter in a special manner. For example, asexually produced plants are treated in this manner under the patent law, as are phonograph records under the copyright law.

Professor Irving Kayton, director of the Computer-in-Law Institute of the George Washington University also recommends this approach to the Patent Office. He points out that if the Patent Office were to accept short-term patents for computer programs, it should be according to the specification of both "obvious" and "novel." (For further explanation, see text accompanying notes 56-59 supra). Interview with Prof. Kayton, July 28, 1971. See also Kayton, Status of Proprietary Rights In the United States For Computer Program Listings and Processes, May 27, 1971 (unpublished paper on file at the Catholic University Law Review office).

\textsuperscript{150} The proposed short-term patents are analogous to "gebrauchsmuster," or petty patents, in Germany. These patents are especially attractive to the small inventor. The primary advantage is that "Gebrauchsmusters are registered quite rapidly (6 to 8 weeks) after a formal investigation . . . . This is in direct contrast to the lengthy and severe examination of Patent Applications, which may be pending for 3 years, and much longer if opposed." Lynfield, "German Utility Models, 47 J. PAT. OFF. SOC'Y 374 (1965). See also Bleistein, The German Law on "Gebrauchsmuster," 19 J. PAT. OFF. SOC'Y 126 (1937).

\textsuperscript{152} If longer (over five years), protection under the modified patent law is desired, a longer term such as ten years could be included. The actual term selected by the program developer could reflect the filing and issue fees which must be paid to the Patent Office.

\textsuperscript{153} Stedman, supra note 133, at 32-33.
protective legislation designed specifically for computer programs. Since computer programs differ significantly from other forms of intellectual and industrial property, forcing computer software into legal classification designed for other purposes is not feasible, nor realistic. The real solution lies in federal legislation tailored expressly for the production and use of software. It is no secret that the computer industry has been plagued by legal problems since its birth 25 years ago. Hence, congressional recognition of this industry is long overdue.

Under Congress' guidance, a special Computer and Legislative Planning Commission should be established having the express raison d'etre of studying the computer industry and recommending the appropriate congressional action. The proposed commission would consist of representatives from the Patent and Copyright Offices, the hardware and software industries, and programmers and expert legal technicians. Open hearings, stressing the particular needs of software, could also be held to insure that the most beneficial "Software Bill" is achieved. The protective system should be based upon two primary considerations: (1) the unique characteristics of the entire data processing field; and (2) the particular business needs of the software industry. A unique registration system, providing short term protection with an explicit scope of coverage should be the administrative objective of the Commission. It is also assumed that enforcement of this newly created protection could be handled without substantial difficulty.

In dealing with the computer industry and its software protection problem, Congress has fallen far behind the needs of the industry itself. The most effective means of computer program protection can be achieved by a special act based on the recommendations of the study and Legislative Planning Commission. Specific legal protection is necessary in order to insure that the software industry continues to grow and prosper. Otherwise the needs of the revolutionary software technology will not be properly met and stagnation will result. The void is there; it is time for Congress to step in and fill it.

Grant E. Morris

154. Other objectives might include: (a) advancement of the general public interest by stimulating the development and use of computer programs; (b) provision of an attractive and practical way of protecting investment in programs, compatible with the business needs of both the creators and the users of computer programs; and (c) timely easy, and inexpensive protection. (d) And finally, the system should facilitate and encourage the dissemination of concepts in order to foster a continuing advance in the state of the art. Doud, The Business of Software and Its Protection, 1969 Proceedings, at p-16.